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Fox River Valley Paper Mills Speed Output

Green Bay Paper Manufacturers Fall Behind Production, Due to Rapid Accumulation of Orders —Northern Paper Mills Increase Operations From Four to Six Full Days—Hoberg Paper & Fibre Co. and Fort Howard Paper Co. Report Notable Gains—Spirit Prevailing In Other Paper Plants Becomes More Optimistic.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 12, 1932.—Orders have been accumulating so rapidly within the past month at Green Bay paper mills that several of them have fallen behind production, a survey made last week reveals. As a consequence, employment has increased, stocks of finished goods greatly diminished and a very optimistic feeling is evident.

"We are actually behind on some of our orders," W. P. Wagner, president of the Northern Paper Mills, declared last week. "Within the last few days our working week has been increased from four to six full days, we have brought our stocks of finished goods down to a low level, and, while we cannot say positively, the increase shows every sign of being permanent."

J. M. Conway, president and general manager of the Hoberg Paper and Fibre Company, and a member of the Wisconsin Unemployment Commission, declared that the increase of the last 30 days has been "the most notable gain in business since 1929."

Austin E. Cofrin, president and general manager of the Fort Howard Paper Company, stated that a definite increase is noted at his concern during the last few weeks.

A more optimistic spirit also prevails in other paper plants in the Fox River Valley, although experience has taught reluctance about too cheerful comment.

Paper Chemistry Institute Resumes

Thirty-five students are enrolled for the opening of the third scholastic year of the Institute of Paper Chemistry at Appleton, Wis., on September 21. Dedication ceremonies for the new J. C. Kimberly Memorial building will be held on that date, but the detailed program has not been completed.

Seventeen students will enter their first year, ten will start their second year, while eight will enter their third. Students were selected from more than two hundred applications. They are graduates of twenty-two colleges and universities, and they live in twelve states.

New students, the colleges and universities from which they transferred and their homes are: William Belvin, North Carolina State College, Raleigh, N. C.; Earle Bryant, University of North Carolina, Clinton, N. C.; LaVerne Gilbertson, University of Wisconsin, LaCross, Wis.; Wells Grant, University of Washington, Seattle; Ward Harrison, Iowa State College, Mason City, Iowa; Abe Lewenstein, University of Minnesota, Duluth, Minn.; William Macaulay, Cornell College, Lisbon, Iowa; James McIntyre, Pennsylvania State College, Freeport, Pa.; Arthur Moss, North Carolina State; Albemarle, N. C.; Charles Roth, Ohio State University, Dayton, Ohio; Robert Rusch, Lawrence College, Neenah, Wis.; Harold Sperka, Lawrence, Oshkosh, Wis.; John Tongren, Pennsylvania State, Ridgway, Pa.; Richard Tucker, North Carolina State, Raleigh, N. C.; Reinhold Vogt, Lawrence, Appleton, Wis., and George Young, Pennsylvania State, State College, Pa.

Old students—Harold Bialkowsky, Massachusetts Institute of Technology, Holyoke, Mass.; Wilbur Cassiday, University of Iowa, Mason City, Iowa; Richard Crain, College of Wooster, Frankfort, Ind.; Roy Davis, Bates College, Athens, Maine; Martin Downs, Pennsylvania State, Reading, Pa.; Homer Eaton, New York University, Canaan, Conn.; James Foote, Ohio Wesleyan University, Delaware, Ohio; Walter Holzer, Reed College, Portland, Ore.; Wilbur Koonce, North Carolina State, Wilmington, N. C.; Edwin Laughlin, Ohio Wesleyan, Delaware, Ohio; Robert McCarron, Massachusetts Institute of Technology, Newton, Mass.; Roy Nilsen, Carleton College, Cloquet, Minn.; Henry Obermanns, Yale University, Erie, Pa.; Sam Robinson, Iowa State College, Des Moines, Iowa; Carl Schroeder, DePauw University, Portland, Ind.; Donald Stark, University of Michigan, Appleton, Wis.; Wayne Stephenson, North Carolina State, Swannanoa, N. C.; Edward Voigtman, University of Wisconsin, Sheboygan, Wis., and Carl Weyerhauser, Harvard, St. Paul, Minn.

Appeal Freight Refund Case

The Marathon Paper Mills Company, Rothschild; the Mosinee Paper Mills Company, Morinee, and the Nekoosa-Edwards Paper Company, Nekoosa, have filed notice of an appeal in their freight refund case to the Wisconsin Supreme Court. The firms recently lost a suit in circuit court to collect refunds from railroads for private switching of freight cars at their mills. The circuit judge held constitutional the 1931 state law forbidding the railroads from reimbursing companies for money they expended in

(Continued on page 16)

Abitibi Power & Paper Co. In Receivership

G. T. Clarkson, of Toronto, Ont., Named Receiver and General Manager On Behalf of Bondholders—Order Provides for Delivery of Properties and Assets and Empowers Receiver to Borrow, to Preserve Assets and Carry On Business

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 10, 1932.—G. T. Clarkson, of Toronto was named today receiver and manager of the Abitibi Power and Paper Company, Ltd., on behalf of holders of bonds of the corporation. Justice Riddell issued the order at Osgoode Hall on an application made by Strachan Johnston, acting for the Montreal Trust Company, Ltd., as trustee under a $50,000,000 mortgage dated June 1, 1928, between the Abitibi company, the Montreal Trust Company and the National City Bank of New York, securing an issue of first-mortgage gold bonds.

In the suit the Montreal Trust Company asks administration and execution of the mortgage by the court. Declaration is also sought that the mortgage is a first charge on undertaking, property and assets of the Abitibi company.

To Deliver Properties to Mr. Clarkson

Justice Riddell's order provides for delivery to Mr. Clarkson of the properties and assets of the Abitibi company. The order declares "no action at law or other proceeding shall be taken or continued against the defendant without leave of the court being first obtained." The order also decrees that the bondholders' committee shall be at liberty to attend the proceedings in the action and its solicitors shall be notified of the proceedings in the case.

The document empowers the receiver to borrow money from time to time as he may consider necessary to protect and preserve the assets of the Abitibi company and the carrying on of its business.

Crop Outlook Helps Dryden Paper

Prospect for a larger crop in the prairies has a definite bearing on the outlook of Dryden Paper Company, with mills at Dryden, Ont. The market of this kraft manufacturer is largely confined to the western provinces and an improvement in purchasing power in the territory served should find a ready reflection in earnings. For the past year Dryden Paper has been laboring under the disadvantage of low prices for its product and relative lethargy in the market it serves. Earnings in the period ended September 30, 1931, were $77,940 compared with $177,054 in the previous year and bond interest was covered by a narrow margin. No provision was made for depreciation. Though there has been no improvement in business during the current year, which closes September 30, it is understood that earnings have been sufficient to cover bond interest requirements. Dryden has a steady back-log in its contract with the Bates Valve Bag Company which has installed its machinery in the Dryden plant for the manufacture of cement bags under the Bates patents. The last balance sheet showed a liquid position with current assets equal to fifteen times current liabilities. In omitting to provide any depreciation in the last fiscal year it is pointed out that about $775,000 was transferred from surplus to depreciation reserve in 1929.

Bondholders Snap Up Government Offer

Acceptance of the Ontario Government's offer to holders of Ontario Power Service Corporation bonds in the Abitibi Canyon power purchase, to exchange them for Hydro bonds, is being agreed to rapidly, states Premier Henry. About half, or $10,000,000, has been handed in for exchange, to which the remainder have yet a month in which to agree. Asked whether the deal would be off if the remainder did not comply with the offer, the premier, with a smile, declined to answer. The Government's offer was made subject to 95 per cent of the bondholders agreeing to the exchange.

Port Royal Plans Increased Output

H. C. Atkinson, manager of the Port Royal Pulp and Paper Company, which recently acquired the Nashwaak Pulp and Paper plant at Saint John, N. B., after a shutdown of two years, states that his company hopes to eventually reach a production mark of 125 tons per month as compared to a previous high total of the old company of 85 tons. At present, in the process of getting the plant ready for reopening, there are seventy men employed with a pay roll of $1,000 a week, the estimated cost of reconditioning being $35,000. It is estimated that the mill will be ready to operate the first of October, producing the high grade bleached sulphite for which the market is almost totally in the United States, with the prospect of the British market becoming an excellent one should such products be given favorable consideration under tariff readjustments. Asked as to why the company had located in Saint John, Mr. Atkinson said the site is the best possible one, with limestone and wood right at the door and the New England markets right around the corner. Pulp will be obtained from up-river points and chips will be brought from the company's mill at Van Buren, Maine. The first shipment of Louisiana sulphur is to arrive this month.

Canada's Wood Pulp Production

It is usually considered that a cord of wood will yield a ton of ground wood pulp or half a ton of chemical pulp. This is borne out by the figures of manufacture of wood pulp for the year 1930, recently issued at Ottawa. These show that in making the 2,283,130 tons of ground wood pulp produced in that year, 2,241,296 cords of wood were required to make 1,076,804 tons of chemical fiber. The average production of pulp per cord of wood used was 2,037 pounds of mechanical pulp, or ground wood, and 993 pounds of chemical fiber.

Protective Committee for Paperboard Co.

A bondholders protective committee of Canadian Paperboard Company, Ltd., was appointed at a recent meeting of bondholders in Toronto, and consists of Gordon McLaren, J. L. Ralson, K. C., Stanley Johnston, and J. G. G. Kerry, president of the company. Canadian Paperboard Company, Ltd., has been in the hands of a receiver since February, 1930. While two of the mills, at Frankford and Campbellford, have been shut down for a considerable period, the plants at Toronto and Montreal have continued to operate. One of the difficulties that has confronted the company and still exists is price cutting, which is declared to be rampant in the industry.

Chicago Paper Market Practically Unchanged

Demand for Various Standard Grades of Fine Paper Continues Listless — Bonds and Ledgers Remain Seasonally Quiet—Sulphite Bond Price Situation Considerably Improved—Excess Tonnage Adversely Affecting Kraft Paper Market

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 10, 1932.—No decided improvement in the Chicago paper market has yet been registered despite the fact that Labor Day has come and gone. There is, however, some improvement noted in the reports of Chicago paper representatives who find several factors being ironed out that are indicative of a turn for better times. Marketwise, the sulphite bond market gives evidence of straightening out its difficulties and those who have contributed to the new measure of stabilization, however slight, are to be commended. Despite drastic efforts on the part of kraft manufacturers and representatives to build a basis for advancement of this market reports indicate that the situation in this section is still somewhat critical. Statements indicate that excess kraft tonnage overhanging the market is making it difficult for an immediate upward trend to occur.

The news print industry is entering the contract season with representatives here dubbing the market itself as "nervous." Weakness prevailing because of the failure of newspapers to get the expected volume of advertising—at last at the present—is a contributing factor to the situation. Bonds and ledgers are seasonally quiet. Ground woods are reported dull with mills carefully watching production and operating on a curtailed basis. Books and covers remain practically unchanged over last week. The board market has not yet felt the demand which must come when manufacturers are forced to meet commitments. The outlook here, however, is said to be somewhat brighter due to efforts on the part of board manufacturers to develop new outlets for their products. Waste papers are dull and, in many instances, markets are reported as "hardly available."

Middle-West Paper Salesmen's Activities

An important announcement concerning the near future activities of the Middle West Division of the Salesmen's Association of the Paper Industry is to be made at the final golf event of the season to be held at the Olympia Fields Country Club on September 16. What sort of news is impending is being withheld by President Harold Knott—so there will evidently be something unusually important ahead for the scribes to report. Incidentally, Courtney Reeves, chairman of the middle west division's golf committee, is certain that all attendance records will be smashed for the final golf event. Not only are the salesmen coming but they are rounding up mill executives and jobbers to be their guests at the final party. A long list of prizes, topped by the *American Paper Merchant* trophy, which the New York and Chicago teams are competing for since the latter group took the Harbison trophy out of circulation, will be up for the boys to shoot for. The President's trophy will also be played for. On September 11 the Salesmen's Association will resume its regular weekly luncheon sessions at the Hamilton Club. No outside speakers will be on hand, at least for a time, thus permitting the salesmen to iron out a lot of problems which arose during the unusual summer just past.

News of the Trade

Chicago paper executives, in rather large numbers, trekked to the Eastern seaboard during the last week of August and first part of September attending various mill functions. J. L. Ham and A. L. Ham, of the Blunden-Lyon Company, attended the sixth annual meeting of the Maritime Cantine service houses late in August. The Hammermill Paper Company annual meeting attracted a large number of Chicago jobbers, including R. S. Bull, Bradner, Smith & Co.; S. B. Gaines and C. E. Roach, Capital City Paper Company, of Springfield, Ill.; C. Braatsch, Chicago Paper Company; W. N. Gillett, Chicago Paper Company; Albert Wittler, Irwin Paper Company, Quincy, Ill.; George Gould and John D. Swigart, Swigart Paper Company and C. T. Roos, National Envelope Company, Waukegan, Ill. John D. Swigart, who is president of the Swigart Paper Company, was elected to membership in the Agents Advisory Committee of the Hammermill Paper Company.

Latest reports from the seventh Federal Reserve district covering figures on the paper and printing industry in this territory as of July 15, 1932, show an improvement over June 15 in number of wage earners but a lowering in the amount of earnings indicative of salary adjustments. The 292 reporting firms reported 38,072 wage earners earning $852,000 for the week of July 15. There was an increase of 0.3 per cent in wage earners for the week ending July 15 as compared to June 15 and a 6.8 per cent decline in earnings during the period. This compared to a 2.0 per cent decline in wage earners and an 8.0 per cent decline in earnings for the entire group of fourteen reporting industries.

A book prepared by the Rand, McNally Company, featuring coming political events and designed to fulfill a popular demand for political information, is being distributed by the Butler Paper Corporation. The contents of the interesting book, which is, copyrighted, include pictures of the candidates, maps, texts of the platforms, happenings at the conventions in Chicago, etc.

C. G. Foster, executive of the J. W. Butler Paper Corporation, was honored at the recent annual meeting of the International Supply Salesmen's Guild held in the East in August, having been elected to the office of treasurer.

One of the few times when paper salesmen leave the paper trade to go into another line of endeavor is recorded with the news that T. D. Gately, formerly Chicago salesman for the Swigart Paper Company and the Dwight Brothers Paper Company, is now associated with A. Nash Company, a nationally known tailoring house.

The West Virginia Paper Company price list on stock sizes and weights in standard mill grades as of September 1 has been mailed out to the trade. The list contains seventeen grades of paper; four grades of Bristol and Post Card stock.

Charge Dumping of Wrapping Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 14, 1932—Dumping complaints have been filed with the Customs Bureau in connection with M. G. sulphite and kraft wrapping paper according to officials of the Bureau.

The usual routine of following up these complaints will be followed it was stated at the Bureau.

Pennsylvania Paper Mills Expand Production

Manufacturers Adopt Broader Schedule, With Operations Now Averaging From Four to Five Days Per Week—Glassine and Paper Board Plants Working On Full Time—Prevailing Demand for Various Standard Grades Indicates Turn In Market

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., September 11, 1932.—With brighter outlook for paper generally the Philadelphia industry is facing a growing business with inquiries indicating a turn in the market. While orders increase among the larger mill representatives in the fine paper division, there is complaint that margins of profit have been cut considerably owing to the low prices prevailing in the keenness of competition to secure volume orders. Distributors state that inquiries made before Labor Day are materializing in actual business with rush shipments of small lots more frequent, indicating low stocks on hand among consumers of fine papers in the commercial printing field. The large printers and publishers are stocking with all lines of book papers, the higher grades holding better to stabilized prices than the lower.

With brighter days ahead the mills are prepared to expand operation as Fall needs require. Manufacturers in the local field are now on broader schedule, with production extended four to five days per week, and among the few glassine manufacturers full time, with a full week also the rule among board mills. Fine paper manufacturers find slower response to Fall expansion but are receiving frequent inquiries for prices as business shows signs of awakening. Converting plants likewise are expanding. Bag manufacturers have larger orders but after a steady summer market have again become involved in price adjustments that create uncertainty.

Arthur Chamberlain Talks To Paper Group

At a meeting of the group of wrapping paper merchants held at the Philadelphia Typothetae last Wednesday, an interesting and elucidating talk on trade topics and the benefits of organized efforts in the building of sound business practices was given by Arthur Chamberlain, executive secretary of the National Paper Trade Association. Following the formation of the Planning Committee, Secretary Chamberlain was introduced by William A. Hentz, president of the Philadelphia Paper Trade Association, who attended the session, though not in official capacity for that body. Secretary Chamberlain expressed his ideas of the advantages that were to be gained in the formation of such a group for the Philadelphia associates and then went into details of the work along similar lines that was being done in other cities by organizations of this character. He gave plans and the type of program which had been worked out in other larger paper centers and cities where trade co-operation had been effective in establishing sound business for the paper merchants.

Paper Merchants Form Reconstruction Group

Due to the deplorable situation in the general wrapping paper market in the Quaker City territory, a group of Philadelphia paper distributors, some affiliated with the local Paper Trade Association and the National Paper Trade Association, others not linked with any paper trade organization, met at the Typothetae headquarters in the Public Ledger Building and discussed the possibilities of forming an organization for the purpose of exchanging ideas for improvement of trade conditions. With seventeen paper houses represented at the meeting, and associates of firms in the Quaker City wrapping paper industry, there was open forum discussion of ways and means to improve the paper market with the returning improvement of business generally. Following the discussion a Planning Committee was selected to devise plans along this line. Those selected to form the Planning Committee are: —Frank O'Neill, Paper Manufacturers Company; Edward A. Keller, Garrett-Buchanan Company; W. C. Killhour, Jr., Quaker City Paper Company; Simon Walter, S. Walter, Inc.; T. H. B. Smythe, J. L. N. Smythe Company; Nathan D. Isen, Enterprise Paper Company; and George W. Ward, D. L. Ward Company. The purpose of the Planning Committee is to arrange bi-monthly meetings on the first and third Wednesdays when trade topics will be taken up for discussion. The Planning Committee will offer constructive ideas for discussion at each meeting. The first of these meetings and discussions was that of last Wednesday and they will continue to be held regularly throughout the future. The next meeting will be held September 21 at a place to be announced later. It is understood that these meetings will promote ethics, better understanding and fellowship among trade associates.

Paper Trade Bowling League to Resume

An announcement and invitation was sent to all paper houses inviting additional teams to join in the Paper Trade Bowling League games which will be resumed with the coming month, by the secretary of the League, Charles Levero, of the Garrett-Buchanan Company, who has called a meeting for the purpose of lining up teams, to be held at the Hudson Bowling Alleys on Thursday evening. The teams already participating in the Philadelphia Paper Trade Bowling League are those of the Whiting Patterson Company, Whiting Paper Company, J. R. Howarth Paper Company, Wolf Brothers, Garrett-Buchanan Company and the D. L. Ward Company, the latter having won the championship last season. It is the purpose of the secretary to add to the teams representing the paper trade. The games will start shortly and will be played at the Hudson Alleys, if the member teams vote to this effect at the coming meeting, instead of the Casino Alleys.

Paper Men to Attend Direct Mail Convention

Philadelphia paper men who will attend the Direct Mail Advertising Association Convention to be held in New York at the Hotel Pennsylvania, October 5, 6 and 7, are George W. Ward, D. L. Ward Company; N. A. Considine, Paper House of Pennsylvania; Paul Craig, S. D. Warren Company, Philadelphia representative; Leon Beck, Charles Beck Company; and Warwick C. Miller, of the Quaker City offices of the Japan Paper Company. These paper trade associates are affiliated with the Direct Mail Committee of the Poor Richard Club, the Philadelphia advertising men's fraternity.

A. M. Collins Mfg. Co. Adds New Covers

There has been added to the lines of the A. M. Collins Manufacturing Company a new line of cover papers which will shortly be available at the executive offices 1518 Walnut street. The new lines will be shown at the Direct Mail Advertisers Convention in New York in October. They include the Leather Glow, sample book of which

BIG NEWS FOR PULP MILLS

Bird Presents Slotted-Plate Centrifugal Screen

Take the best qualities of every type of pulp screen ever built—pack them all into one—and you'll have some idea of the new Bird. Never before has the industry seen anything which even approaches its performance.

For the complete story on the new Bird Slotted Plate Centrifugal Pulp Screen—its unequalled quality of output—its low cost-per-ton—its capacity and flexibility—write today for the new Bird Pulp Screen Bulletin.

BIRD MACHINE COMPANY
South Walpole - - - - Massachusetts

BIRD PULP SCREEN

5464

will be ready this month and the Bookcraft, both in leather effects; also the Hand Weave, a fabric finished cover. The new lines are popularly priced to meet present business requirements.

Helen Garrett Wins Scholarships

Helen Garrett, who is known to the trade as former assistant to her father, Sylvester S. Garrett, head of the paper concern bearing his name, sails for France on Wednesday to take up studies and duties in connection with two French scholarships awarded her for excellence in studies at Swarthmore College, from which she graduated last June. One of the scholarships entitles her to teach the English language at the Girls Normal School at Armentieres and the other to continue post graduate work in the French language at the University of Lille, ten miles away, in philosophy and history. Miss Garrett, while a student at Swarthmore, spent her vacations in business association with her father. She graduated with honors at Swarthmore and was awarded the scholarships. The Garrett family have been linked with the paper making and distribution industry in Philadelphia for over 100 years.

Correction

In this section on August 18 it was erroneously stated that the National Waterproofing Company had developed a new wrapping and lining paper called Dry-Pack. This should have read "Drihide." The name Dry-Pack has been in use for many years by one of its competitors.

News of the Trade

Winfield Predmore, president of Paper Merchants Inc., 140 North 6th street, who has been attending to business in Boston, returned to his desk last week.

Charles McDowell, head of the McDowell Paper Mills, returned to his desk after Labor Day following a month's yachting trip along the coast of Maine. The McDowell Mills are now on full time as a result of the betterment in the glassine market.

Robert Samson, head of the Hoberg Paper Company, manufacturers of towels and sanitary tissues, Green Bay, Wis., was a guest of George W. Ward, of the D. L. Ward Company, sole distributors of the products of the Hoberg Company, over Labor Day.

Netherlands Paper Production Low

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 31, 1932.—Paper production by the Netherlands mills underwent a further reduction during the second quarter of the year according to a report to the Department of Commerce. While several mills operated on a five day week schedule in the preceding three months, most of them found it necessary to cut down their running time to four days, beginning with April. Production is far below machine capacity, and the opinion is freely expressed that most mills are accepting orders at prices below the cost of production.

Geo. W. Sisson, Jr., Gets Appointment

ALBANY, N. Y., September 14, 1932—Announcement is made of the appointment of George W. Sisson, Jr., president of the Racquette River Paper Company, as a member of the State Agricultural Committee which has plans under way for the establishment of a regional agricultural credit corporation in the district of which this state is a unit. A legislative act of last winter is understood to have cleared away barriers which had prevented this state from taking advantage of federal aid.

FOX RIVER MILLS SPEED OUTPUT

(Continued from page 11)

doing their own switching. The suit is against the State Public Service Commission and the North Western, Milwaukee, and Soo Line railroads.

Home Products Week

A good proportion, and probably nearly all, of the paper mills in Wisconsin are taking a prominent part in preparations for the Wisconsin Home Products Week, from September 25 to October 1. This week, which is to be observed throughout the state, is sponsored by the Wisconsin State Chamber of Commerce, and has for its purpose advertising the products made in Wisconsin. Store windows will be used for the exhibitions, which will consist of machines of various kinds actually turning out a product, miniature displays of products, pictures of big jobs done by companies, displays of manufactured articles and raw materials as they appear in various stages of manufacture.

Newspapers throughout the state are giving a great deal of publicity to the week, and speakers have appeared or will appear in programs in many cities.

Pulp Arrives From Sweden

Six hundred tons of wood pulp arrived last week at Milwaukee from Guttenberg, Sweden, for transshipment by rail to mills in Fox River Valley cities. Lake shipping reached its highest point of the season last week at Milwaukee when twelve freighters slipped into port, nine of them carrying coal.

Claremont Paper Co. Changes

G. M. Wetmore, sales manager of the Claremont Paper Company, Inc., with offices at 33 West 42 street, New York, announces that John C. Penton (Jack Penton) who has been with the company for six years and travelled New England territory and New York State, is being transferred to the company's western territory. Mr. Penton having been with the Claremont Paper Company for quite a while, is thoroughly familiar with its line and therefore will be in a position to serve in a very satisfactory manner the company's western customers.

W. T. Libby (Bill Libby) who for a number of years was assistant general superintendent of the Brown Company's Riverside and Cascade Mills at Berlin, N. H., and more lately connected with their Boston sales office, has been added to the sales organization of the Claremont Paper Company to represent the company in New England. Mr. Libby's long experience in the kraft industry will be of material advantage to him in serving the company's customers in a very satisfactory manner.

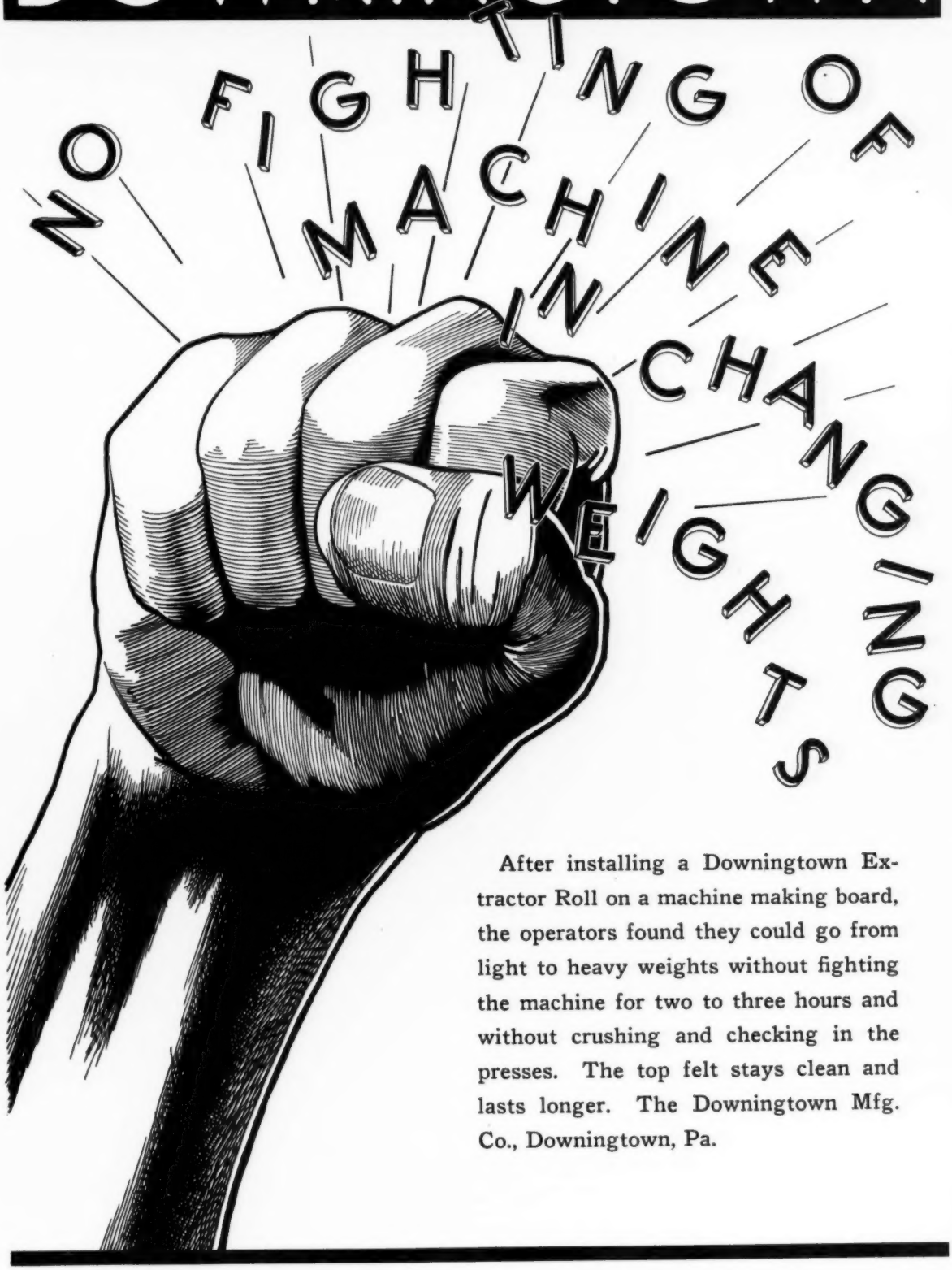
I. P. Starts Mill at Turners Falls

[FROM OUR REGULAR CORRESPONDENT]

TURNERS FALLS, Mass., September 5, 1932.—The International Paper Company will open the local plant Tuesday morning on a full-time basis with a full force of workers.

During the past week there has been considerable activity around the plant in preparation for the resumption of production. A number of men were called back during the week to put the plant in readiness and nearly 100 were on the payroll by the end of last week. The three paper machines will start Tuesday morning, the pulp mill having already run two or three days to build up the supply of pulp. Nearly 200 employees will be at work Wednesday and the starting of the mill, which has been shut down for five months, will mean much to this town.

DOWNINGTOWN



After installing a Downingtown Extractor Roll on a machine making board, the operators found they could go from light to heavy weights without fighting the machine for two to three hours and without crushing and checking in the presses. The top felt stays clean and lasts longer. The Downingtown Mfg. Co., Downingtown, Pa.

Beauharnois to Start Power Delivery Shortly

Project Forms Integral Part of Proposed St. Lawrence Ship Canal—Paper and Pulp Enterprises Intimately Associated With Hydro-Electric Development In Quebec—Evidences of Over-Production of Power Are Beginning to Multiply

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 12, 1932.—The situation in regard to hydro-electric development in Quebec, with which pulp and paper enterprises are so intimately associated, is becoming one of keen speculative interest, because evidences of an over-production of power are now beginning to multiply, at the very time when large supplies are coming on the market through the completion of new power enterprises.

The situation is given special interest because of the announcement that the Beauharnois Power Company will be in a position to start delivery of power on October 1 under its contracts with Montreal Light, Heat and Power Consolidated and the Ontario Hydro-Electric Power Commission, which between them have agreed to take about 400,000 h.p. of the initial 500,000 h.p. to be developed. Four units of 50,000 h.p. each have already been installed. Both in Quebec and Ontario there is at present a surplus of power available to both the organizations to which Beauharnois will start delivery, but so far there has been no official announcement as to how the power will be disposed of.

The Beauharnois development, it may be recalled, is on the St. Lawrence River a few miles above Montreal, and the fifteen-mile power canal constructed in connection with the project will form an integral part of the St. Lawrence ship canal to be built under the treaty arrived at between Canada and the United States.

Construction of the works has been carried out well within contract time and at a cost below the original estimates. The plan ultimately is to develop some 2,000,000 h.p. at this point, making this the largest single plant of its kind in the world.

A feature of the undertaking is that in its agreement with the Quebec government, the company contracted to pay the Province of Quebec $1 per horse-power developed. Premier Taschereau, in an interview on the subject a day or two ago, stated that this agreement will stand, notwithstanding the revision of the company's contract with the Federal Government, brought about by the revelations that large sums of money had been paid by the company to political interests in connection with securing the original charter.

Meanwhile interest payments on the company's debentures have been suspended and until the committee for the debenture holders issues a statement of its recommendations there is no indication as to when interest payments will be resumed. There are substantial bank loans which will have to be funded as soon as possible and the interest charges on such a bond issue would naturally precede interest on the debentures. Beauharnois debentures have shown a considerable appreciation in price during the past month or more and were currently reported at 41 to 43.

Electric Current for Steam Generation

In order to take up the slack in demand for hydro-electric current, the Shawinigan Water and Power Company is encouraging the use of electric boilers for pulp and paper plants, thus replacing coal. The old Lawrentide plant at Grand Mere has been using electricity supplied at low cost for this purpose for some time.

The Wayagamack mill of the Consolidated Paper Corporation at Three Rivers has now just brought into operation a 55,000 h.p. electric boiler. This boiler, operated by power from the Shawinigan Water and Power Company, will supply up to 120,000 pounds of steam per hour, which is nearly sufficient to operate the entire mill.

The Anglo-Canadian Pulp and Paper Mills, Ltd., is just about to commence operation at its paper mill at Limoilou, Que., of another 55,000 h.p. electric boiler. This will be the second unit of this size in operation in this mill, and the two electric boilers together will supply up to 240,000 pounds of steam per hour. When the second electric boiler comes into operation, the full requirements for steam will be supplied electrically.

Another electric boiler of 33,000 h.p. capacity is being installed in the plant of the St. Lawrence Paper Mills Company, Ltd., at Three Rivers, and will be put in operation about the 1st of November.

The above-mentioned additional units to the system of the Shawinigan Water and Power Company bring the total capacity of the electric boilers installed up to 525,000 h.p.

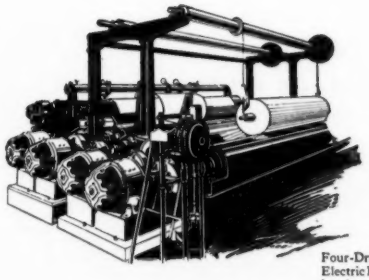
Newfoundland's News Print Developments

C. B. Birkett, junior Canadian Trade Commissioner in Newfoundland, in reporting on conditions in that country to the Department of Trade and Commerce at Ottawa, has some interesting remarks to make regarding the phenomenal rise of Newfoundland as a producer of news print. He says:

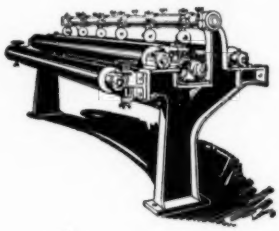
"During the last decade the news print industry has made such progress in Newfoundland that it now rivals the fishing industry in importance. In 1921 the production of news print amounted to only 60,000 tons, while in 1931 it totalled nearly 300,000 tons. This remarkable growth has been due to exceptionally favorable manufacturing conditions. Large and easily accessible timber resources, low cost power and labor, and water transportation facilities have enabled Newfoundland to produce news print on a basis probably more favorable than that of any other country. Consequently the two mills operating on the island, namely the Anglo-Newfoundland Development Company at Grand Falls and the Canadian International Paper Company at Corner Brook, maintained opertions at capacity for the past few years. Wages in the former mill have been reduced by 8 per cent and in the latter two cuts of 10 per cent each have been made. A further curtailment is that of the Corner Brook mill closing down their woods operations this year, which will throw many men out of work for the coming autumn and winter.

"The Anglo-Newfoundland Development Company, which is largely controlled by English newspaper interests, operates five machines with an output of 400 tons a day and finds its principal market in Great Britain. The Canadian International Paper Company, which is owned by United States interests, operates four machines with an output of 500 tons per day and ships practically all its product to the United States. Of late there have been a

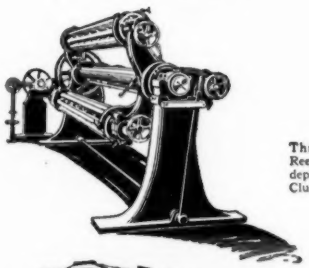
PAPER MAKING MACHINERY



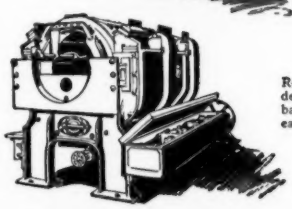
Four-Drum Winder with Electric Drive. Controls roll hardness automatically.



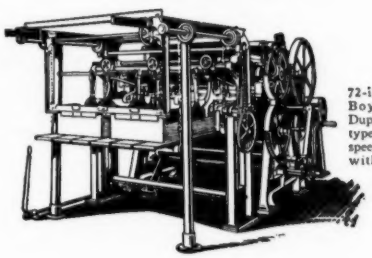
Ball Bearing Slitter Part. Quick-removable top and bottom blades give greater production with less waste.



Three-Drum Revolving Reel. Each drum has independent M&W Friction Clutch drive.



Rotary Screen, with divided diaphragms giving balanced movement and easy flow.



72-inch single Lay Boy and Cutter. Duplex and Diagonal types also made. High speeds may be used with wide cutters.

Fourdrinier Paper Machines
Quick changing wire features

Cylinder Paper Machines
for all grades of board

Bevel Gear Drive Stands
with Ball Bearings and M & W High Speed Friction Clutch

Brass Collapsible Winder Shafts
Non-sticking; quick-changing

"Criss Cross" Shower Pipes
High efficiency with low water consumption

Disc Washers, new type

Drum Winders
Two-Drum type for small rolls
Four-Drum type: electric or belt drive
Two-Drum and Four-Drum Supercalender Winders

High Density Bleaching Process
Wolf, Bellmer, Fletcher

Hoffman Couch Rolls
Superior to rubber rolls

Pumps: Stuff; Suction; Centrifugal

Reels
With 2, 3, 5 or 6 drums; Upright and Revolving types

Rotary Screens
Clean paper with minimum maintenance

Save-Alls
Economical, efficient closed system

Single and Duplex Cutters
High speeds—all widths—all kinds of paper

Single and Duplex Lay Boys
Increase cutter output; reduce finishing room costs

Slitter Parts
New ball bearing type, with removable Slitters, saves slitter tears

Wire and Felt Guides
Ball and plain bearing types for all speeds

Wood Suction Box Covers
Save wear of the Fourdrinier wires

M & W Friction Clutches and Speed Changes
Information and Bulletins on request

THE MOORE & WHITE COMPANY

Established 1885

PAPER MACHINE BUILDERS

15TH ST. & LEHIGH AVE., PHILADELPHIA, PA.

few small shipments of pulpwood by permission of the Newfoundland Government, which exercises control over such shipments."

Liquor Advertising and News Print Consumption

Now that political developments in the United States seem to forecast the abandonment of prohibition, a situation which has developed in Canada in regard to the advertising of liquor may be of special interest to American news print producers. In most of the Provinces in Canada and notably in Quebec Province, brewers and distillers are among the largest and most consistent advertisers in the daily newspapers, thereby contributing indirectly to a larger consumption of news print. In Ontario, however, the Provincial Liquor Commission has forbidden brewers and distillers from advertising in any shape, manner or form. Evidence of wide spread pressure to lift this ban is now appearing. For instance, F. D. Burton, of Iroquois Falls, which community depends for its existence on news print manufacturing, writes a letter to the Ottawa papers in which he says:

"To the man on the street, it would appear that those responsible for this travesty of justice were so full of super-conceit as to believe that the people who were entrusted with the sanity to vote on Liquor Control were not to be trusted to see beer or whiskey advertised in print.

"This injustice goes along all the way down the line. Quebec dailies are able to reap the benefits of this advertising, which amounts to a large item, while Ontario papers are denied this privilege. The amount of advertising which would arise from the lifting of this ridiculous ban would allow Ontario dailies to increase the size of their papers and in turn mean greater tonnage for some Canadian paper mills, which are operating at curtailed production, giving work to those unemployed in the paper trades.

"When one reads the spurious ads in certain weekly papers of a disreputable type, one wonders whether reading ads for questionable things is any more harmful to the public mortals than readings ads for beer. Certainly the brewery and distillery business is as honorable and legal as any other.

"I might say that I have no shares in breweries or distilleries, neither am I interested in the extra money that the newspapers would receive, but I am interested in the possible extra tonnage to news print mills which would result."

Rumor of Price-International Deal

The possibility of International Paper Company acquiring control of Price Bros. & Co. Ltd., which had been discussed prior to the entrance into the situation of Lord Beaverbrook, is again rumored according to the *Financial Times*, of Montreal.

The chief basis for the rumors appears to be the association with past financing of the International group of the United States interests which were responsible for the formation of the Price Brothers bondholders protective Committee.

Abraham Bazar Bankrupt

[FROM OUR REGULAR CORRESPONDENT]

PROVIDENCE, R. I., September 12, 1932.—Abraham Bazar, 37 Warrington street, waste paper dealer, has filed a voluntary petition in bankruptcy. Liabilities are given as $29,461; assets $5,000. Largest creditors: Samuel Bander, $1,300; Frances Herzon, $1,000; Sam Gordon, $1,000; Louis Meisel, $17,000; Simon Bazar, est., $2,000; all of Providence, unsecured.

New York Trade Jottings

Franklin Reed, executive secretary of the Society of American Foresters, Washington, D. C., visited New York early this week.

* * *

Dr. Charles H. Herty, internationally known chemist, and director of the Georgia experimental pulp and paper laboratory, Savannah, Ga., is a New York visitor this week.

* * *

Walter Hicks, of Daniel M. Hicks, Inc., dealers in paper mill supplies, of 200 Fifth Avenue, New York, has returned to duty after spending an enjoyable vacation on Shelter Island, N. Y.

* * *

The Eastern Division of the Salesmen's Association of the Paper Industry resumed its weekly luncheons last Monday, September 12, at the Hotel Roosevelt Grill, New York. Those present joined in an interesting round-table discussion of prevailing business conditions.

* * *

B. D. Wheeler, formerly treasurer of E. Butterworth & Co., New York, is now associated with Keene & Arkus, Inc., importers and exporters of rags, etc., of 175 Fifth Avenue, New York, and has been elected vice-president of the corporation.

* * *

Edwin G. Straus, president of Artcote Papers, Inc., of Irvington, N. J., since its organization in 1927; has resigned his office and disposed of his interest in the company. Mr. Straus is well known in the paper, packaging and printing fields, and the change in his business plans comes as a surprise to his friends in the trade who look with interest to any new business with which he may be associated.

* * *

The National Association of Waste Material Dealers, Inc., together with its subsidiary or divisional associations, is planning to open its Fall and Winter activities on September 22nd with an informal gathering at association headquarters, Times Building, New York, for its New York members as well as any out-of-town members who may find it possible to attend. A buffet luncheon will be served at the association's headquarters from 12:30 to 2 on the above date and it is expected that all New York memberships will be represented, as well as a number of memberships from Boston, Philadelphia and nearby points. President Birkenstein will attend and a board of directors meeting which will be held at 2:30 on the same day will bring a number of out-of-town directors to New York for the gathering. A similar informal gathering is being planned by Philadelphia members and with business conditions in the waste material industry improving, such gatherings are likely to be held in the larger cities throughout the country.

Albany Paper Co. Incorporates

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOIS, Ind., September 12, 1932.—Articles of incorporation have been filed with the Indiana secretary of state by the Albany Paper Corporation, Albany, Ind. The corporation has an initial capital stock of 50 shares valued at $100 each and will manufacture paper, box board and other paper products. The first board of directors is composed of A. E. Bentham, Lent T. Benthan, Walter R. Butler and Dorathy A. Butler.

...and this is pitiful!

CANCER may, in many cases, be cured if caught in the early stages. It is pitifully true that people in general do not know this.

The purpose of our organization is to disseminate this knowledge and also to do what we can for the sufferers from cancer in its later stages.

We have helped many, but even more are in need of help.

We cannot continue our work unless you come to our rescue.

Will you send for our package labels and use them not only on your Christmas packages but also on all your packages? They cost one dollar.

We shall be most grateful.

NEW YORK CITY CANCER COMMITTEE
American Society for the Control of Cancer
34 East 75th Street, New York

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ESTABLISHED 1872

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Vol. XCV New York, September 15, 1932 No. 11

COMING EVENTS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Nonotuck Hotel, Holyoke, Mass., September 14, 15, and 16, 1932.

PAPER AND PULP SECTIONS OF THE NATIONAL SAFETY COUNCIL, Twenty-first Annual Safety Congress and Exposition, Wardman Park and Shoreham Hotel, Washington, D. C., October 3, 4, 5, 6 and 7, 1932.

SAFETY IN PAPER MILLS

During the week of October 3 to 7, many delegates from pulp and paper plants of the United States will assemble at the Wardman Park and Shoreham Hotels in Washington, D. C., to consider practical, cooperative methods for the promotion of health and the reduction of accidents in the industry. This program will be conducted by the Paper and Pulp Section of the National Safety Council as a part of the 21st Annual Safety Congress and Exposition. J. J. Plzak, Consolidated Water Power and Paper Company is general chairman of the Section; Geo. Roller, Rhinelander Paper Company and Arthur Murray, Container Corporation of America are vice chairmen; and H. D. Banta, Hoberg Paper and Fibre Company, is secretary.

During this period lost time injuries have decreased 28 per cent, and accident severity rates have decreased 11 per cent. Proof of increasing interest in accident prevention is indicated by an increase of 20 per cent in 1931 in the number of reporting mills, as compared with the previous year. For that year 239 organizations whose employees worked almost 163,000,000 man hours reported. Effort is also being made by the Paper and Pulp Section to encourage a large number of mills to furnish departmental records, to afford greater accuracy in comparing the accident experience of different plant departments.

The program, beginning Tuesday morning, October 4, will be introduced by a talk on "Are We Obtaining Our Objections?" by J. J. Plzak, general chairman. There will be a talk on "Lessons Learned from Near Accidents in Paper Mills" by W. C. Brydges, president, the American Pulp and Paper Mill Superintendents Association, and superintendent Bedford Pulp and Paper Company. There will be election of officers, and a Question Box will be conducted by G. W. Phillips, safety engineer, Champion Fibre Company.

The Tuesday afternoon meeting will include talks on "Are We Hitting the Bull's Eye?" by E. E. Grant, chairman, Statistics Committee; "Lessons to be Learned from Paper Mill Fatalities," by H. G. Gilson, safety supervisor, Oxford Paper Company; and "Dual Control on Guillotine Cutters" by Walter A. Gleason, Safety Director, Hammermill Paper Company.

For the Thursday morning session, George J. Adams, general supervisor, International Paper Company and chairman, Nip Hazards Research Committee will talk on "Nip Hazards—Their Control and Elimination." The discussion will be led by Arthur Murray, insurance manager, Container Corporation of America.

At the Thursday Luncheon Session "Data on the 1931-32 Safety Contest" will be presented by A. Scott Dowd, chairman, Contest Committee. The Presentation of Awards in the National Safety Council Trophies will be made by an officer of the National Safety Council.

The Thursday afteroon session will include "Participation of Industry in Community Safety" by R. G. Knutson, Member, Industrial Commission of Wis.; "Special Hazards of Fourdrinier Machines and Their Elimination," by H. K. Williamson, general superintendent, Nekoosa-Edwards Paper Company. The "Pro and Con Hour" will be conducted by Arthur E. Winslow, manager of personnel, Hollingsworth & Whitney Company.

The Annual Safety Congress program as a whole will be broad in scope and will have many new features. There will be 41 general and sectional programs, with 120 different sessions and about 350 speakers of prominence and authority in their respective fields.

Special attention will be given to the problems of industrial health. There will be a number of addresses by specialists before different industrial groups, four half-day sessions of the Industrial Health Section, and one session on Industrial Nursing.

The dust problems in industry, both from the health and the engineering viewpoints, will be considered. There will be an address on "Dust—An Engineering Problem" by Leonard Green of Yale University, before the Advanced Safety Engineering session. This will be supplemented by a Dust Explosion Demonstration at the U. S. Department of Agriculture Testing Station near Washington, D. C., by Dr. David J. Price of the Engineering Division of the Bureau of Chemistry and Soils.

The Industrial Health Section will give an afternoon to a "Symposium of the Dust Problem in Industry" by five specialists. There will be another session on "Health Work in the Small Plant"; and still another devoted to a "Symposium on Activities of the Chemical Industry in Preventing Poisoning," from the viewpoints of the chemical manufacturer, the State, and the Federal Government.

Relating to mental health and applied psychology, there will be two addresses before the Petroleum session on "Psychology and Accidents—Mental Ease During Depression," and "Effects of Competition on the Morale of Employees." "The Mental Hygiene of Accidents" will be discussed before the Cement Session. An entire session of the Delivery, Taxicab and Bus Section will be given to "Treating Accident Proneness" of commercial car drivers.

Another important general feature will be the exhibit of the most modern equipment for the promotion of safety and health in industry and in public places. This will include protective clothing, new developments in mechanical safety devices, motor car control equipment, the latest fire prevention methods, and modern first-aid kits and hospital accessories. There will be first-aid demonstrations by the Red Cross, and safety educational exhibits by the U. S. Bureau of Mines and the U. S. Navy.

Another Congress feature will be four early morning sessions which are planned as practical demonstrations in the new technique of "Safety in Foremanship by the Conference Method." They will be conducted by M. J. Kane, plant training engineer of the American Telephone and Telegraph Company.

The American Society of Safety Engineers—Engineering Section will hold several sessions to consider problems relating to new industrial safety codes. These will include the construction safety code, the ladder safety code, and problems of electrical cut-outs. Special committees on "Woodworking Circular Saws," "Low Voltage Electrical Hazards," and "Portable Blow Torches," will have meetings.

There will be additional special sessions on Fire Prevention, Employee Publications, Governmental Relations, Home Safety, Child Education, Vocational Schools, and Public Safety.

The holding of the Annual Safety Congress in Washington, D. C., will lend an appropriate national tone to the deliberations. It will emphasize, regardless of economic conditions, that there has been no lessening in the need for industrial and public safety activities.

Union Bag Increases Schedules

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., September 14, 1932—Increased schedules have been placed in effect at the Allen branch of the Union Bag and Paper Corporation, which is now operating three shifts daily. The mill had been operating with two shifts since the strike was declared last spring but an increased volume of business is believed to be the principal factor for starting the extra shift. The open shop is still being observed and there are no signs of a settlement of the strike controversy in sight. Walter Metcalf, who has been superintendent of the Allen division for several weeks, has resigned. During the absence of John T. Gamble, general manager, the mill is under the supervision of William Duncan.

The strikers are continuing to maintain a picket line at the mill and clashes occur frequently. An outbreak during the week resulted in a discharge of tear gas into the ranks of the strikers by the local police. Strikebreakers are continuing to be housed in dwellings supplied by the company.

Bids and Awards for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 14, 1932.—The Government Printing Office has received the following bids for 5,000 pounds of writing paper; R. P. Andrews Paper Company, at 6.75 cents per pound; Whitaker Paper Company, 5.9 cents and 6.27 cents; Aetna Paper Company, 5.37 cents; Charles G. Stott & Company, Inc., 6.326 cents; Old Dominion Paper Company, 6.74 cents; American Writing Paper Company, 7 cents; Barton, Duer & Koch Paper Company, 6 cents; Reese & Reese, Inc., 6.6 cents; and Hawthorne Paper Company, 8.6 cents.

The Printing Office also received the following bids for 5,000 pounds of ledger paper; R. P. Andrews Paper Company at 11.09 cents per pound; Whitaker Paper Company, 9.2; Aetna Paper Company, 7.87 cents; Dobler & Mudge, 10.9 cents; Mathers-Lamm Paper Company, 11.5 cents; American Writing Paper Company, 9 cents; Barton, Duer & Koch Paper Company, 9.5c; Reese & Reese, Inc., 13.85 cents and Hawthorne Paper Company, 9.2 cents.

The Government Printing Office has announced the following paper awards.

The Virginia Paper Company will furnish 396 pounds (2,000 sheets) of golden red coated book paper, 28 x 42, at 12 cents per pound and the R. P. Andrews Paper Company will furnish 8,850 pounds (25,000 sheets) of No. 1 rope manila drumhead paper at 12.86 cents per pound. Bids for these items were received on August 26.

The R. P. Andrews Paper Company will furnish 2,000 sheets of red glazed paper 20 x 24 at $8.00 per M sheets, bids for which were received on August 24.

Barton, Duer & Koch Paper Company will furnish 500,000 pounds of manila calendered tag board in 23¼ and 26½ inch rolls at 6.55 cents per pound, bids for which were received on August 8.

The Aetna Paper Company will furnish 9,900 pounds (75,000 sheets) of 26 x 34, 50 per cent rag white natural tint paper at 10.87 cents per pound, bids for which were received on July 29.

Knowlton Bros. Report Improvement

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., September 14, 1932—A decided improvement in business conditions is reported from the mills of Knowlton Brothers and during the past several weeks a schedule of 24 hours a day has been observed. At the present time, however, the mills are running five days weekly on a twenty-four hour daily schedule with indications that orders will permit steady operations until the first of the year at least.

It was announced that a further improvement in business would necessitate a schedule of six days a week and officials are very much encouraged over the outlook. The working force now numbers about 125 hands. The company produces high grade colored specialties and has developed a number of lines for which the demand is said to be unusually good.

News Print Rates Not Unreasonable

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 14, 1932—In a proposed report to the Interstate Commerce Commission an Examiner states that rates on newsprint paper, in carloads, from points in Oregon and Washington to destinations in Idaho on the line of the Oregon Short Line Railroad Company are not unreasonable. He recommends that the complaint made by the Public Utilities Commission of the State of Idaho against the Oregon Short Line be dismissed.

BENNETT
TRADE MARK

ROSIN SIZE

The Bennett Process for making Rosin Size eliminates objections to the old rule of thumb method of size cooking. The Equipment is simple and economical to operate, producing a uniform size of high quality. Neutral rosin soap, or rosin sizes with various proportions of free rosin can be made, which gives each paper mill the opportunity of manufacturing that type of size best suited to local conditions. Any grade of Wood or Gum rosin can be used, even the low grades which cannot be employed satisfactorily in other processes.

A Bennett Installation will save over 30% of the cost of buying rosin size. Our Technical Representatives will furnish blueprints showing complete layout of Equipment in your mill. In many cases storage tanks and dilution systems now employed for handling prepared size, can be utilized in connection with a Bennett Size Making Unit, which makes the required investment very small.

The Test of Commercial Use

Here is what one concern wrote after trying out the Bennett Size Making Process:

"Numerous types of rosin soaps have been made. The uncombined rosin content, including unsaponifiable matter, based on the weight of the dry soap, has been varied from 7% to 35% and the solid matter from 50% to 77%. In certain types of rosin soaps, the solid matter has been raised to 85%. No difficulty has been experienced in holding the uncombined alkali, even with neutral soaps, to within .5%; usually it is from .2% to .3%. These different types of rosin soaps vary widely in their physical properties. Some at operating temperatures are liquid; others are gelatinous. The Bennett Machine has proved its adaptability under these different operating conditions."

Bennett Incorporated
CAMBRIDGE, MASS., U. S. A.

Bennett Limited
CHAMBLY CANTON, P. Q., CANADA

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

The National Research Council, 21st and B Street, Washington, D. C., through Dr. Clarence J. West, extends the courtesy of its photostat service to members of the Technical Association of the Pulp and Paper Industry. Owing to a limitation of personnel and time, this service cannot be extended to non-members.

The charge for the photostat service is: 9 x 11 inches—18 cents per page, 18 x 11 inches—35 cents per page, 22 x 18 inches—70 cents per page, minimum charge, 50 cents.

Payment should be made upon receipt of invoice.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Mechanical Process

The granulation and sharpening of grind stones for wood pulp. Julius Herrmann. Wochbl. Papierfabr. 63, No. 17: 325-327 (April 23, 1932).—A grind stone first tears away splinters of wood which are then ground up, the reverse process takes place only to a small degree. The author then tells of the effects from sharpening the stone in the usual manner and by sharpening the stone with a different type of sharpener called the Arnold or elastic type in which the perssure against the stone is regulated by a spring.—J. F. O.

Pulp Grinding Stone. Wallace W. Greenwood assignor to Norton Co. U. S. pat. 1,850,231 (March 22, 1932).—Silicon carbide granules of 24-mesh size are mixed with a bond consisting of a mixture of feldspar, ball clay and ground quartz, molded into suitably shaped segments, dried and fired in a ceramic kiln at a temperature approximating Orton cone No. 12. The cracks between the segments are filled with a low-melting alloy which will wear down at the same rate as the abrasive segments; *e. g.*, 91 per cent tin, 4.5 per cent antimony and 4.5 per cent copper.—A. P.-C.

Continuous Wood Grinder of the Chain Type. Richard T. Lang assignor to American Voith Contact Co., Inc. U. S. pat. 1,843,605 (Feb. 2, 1932).—The guides for the feed chains are brought down to the center plane of the lower sprocket to a position as close as possible thereto, thereby providing a positive non-changing grip of the chain on the wood and avoiding a loosening and recompressing of the wood in the magazine. These actions are aided by the provision of specially shaped chain links with either a roller projecting on both sides over the teeth of the sprocket wheel, or links with a middle roller having about the same width as the teeth of the sprocket wheel and two additional rollers outside of the chain links.—A. P-C.

Process of Separating Wood Fibers. George H. Ellis assignor to The Insulite Co. U. S. pat. 1,850,832 (March 22, 1932).—Wood chips are fed to a hopper together with hot water and steam and are delivered at a regulatable rate to a grinder consisting of two abrading disks rotating in opposite directions, the chips being fed through an opening in the center of one of the disks and discharged at the periphery between the disks. An essential feature of the invention is the addition of both steam and hot water at the point at which the chips are fed to the hopper, so as to ensure prolonged action of heat on the chips.—A. P.-C.

Alkaline Process

Kraft paper. Zellstoff Papier 12, No. 3: 119 (March, 1932).—Important statistics concerning the kraft paper industry are given, such as the total production and consumption, in the U. S. A., Sweden, Norway, Finland and England, for the year 1930. Strength values are given for the standard sizes and weights for the various countries, and specifications for paper to be used for certain purposes, such as cement sacks, etc.—J. F. O.

Influence of temperature on the duration of cellulose cooking. Ya. Khinchin. Bum. Prom. 11, no. 1:31-36 (1932); C. A. 26, 3375.—Khinchin gives a critical discussion of the investigation of Bray and his collaborators on the interrelation of four principal factors in cooking cellulose with sodium hydroxide; concentration of sodium hydroxide, duration of cooking, steam pressure (temperature) and the total sodium hydroxide in relation to the amount of material.—C. J. W.

Cellulose from Cornstalks. Elton R. Darling assignor to Cornstalk Products Co., Inc. U. S. pat. 1,846,511 (Feb. 23, 1932).—Plant material such as cornstalks is shredded and washed, the shredding and washing are repeated, and the material is then subjected to a softening operation by heating with a solution containing an alkali such as caustic soda and a reducing agent such as sodium sulphite, and the pulp thus formed is pumped into a digester together with the liquor employed for the softening

and is subjected to boiling under pressure to dissolve non-cellulosic constitutents.—A. P.-C.

Continuous Pulping and Bleaching Process for Bamboo, Straw, etc. John Traquair assignor to The Mead Research Engineering Co. U. S. pat. 1,843,466 (Feb. 2, 1932).—The material is fed from a duster through a feed hopper, in which it is sprayed with about 20 times its weight of a weak alkaline solution (*e.g.*, 1 per cent caustic soda) into a steeping tank at a temperature of about 90 deg. C. through which it passes in from 30 to 60 min. On leaving the steeping tank it is thickened to a consistency of 25 to 30 per cent and fed to a digester in which it is cooked for about 1 hour at 180 deg. C. with the residual liquor, without addition of liquor or chemical. It is then discharged into a blow-pit, washed and subjected to a chlorination treatment (single-stage if it contains less than 5 per cent residual incrusting material, double-stage if it contains more than 5 per cent). The spent alkaline liquor is recovered by known method. The whole process is continuous.—A. P.-C.

Concerning the heating of the black liquor from the manufacture of sulphate pulp under pressure and the products obtained thereby and their properties. Erik Hagglund, M. Tuominen and Kurt Lindblom. Wochbl. Papierfabr. 62, No. 23A : 47-53; No. 38:902-907 (June 6, Sept. 19, 1931).—The authors describe their method whereby valuable organic products are recovered from the black liquor by heating it under pressure at 350 deg. C., collecting the acetic acid and methanol, the residue being corbanized sufficiently that it can be causticized and again used in the cooking. The conditions under which the experiments were carried out are fully given as well as about fifty tables giving the pertinent data and results. Pine wood, aspen, beech, birch, rye straw and esparto grass were used in the experiments and yields of tar and carbon, methanol, acetic acid, acetone, and gas tabulated. The influence of catalysers is discussed.—J. F. O.

Occurrence of minerals in connection with the evaporation of black liquor in the sulphate cellulose process. Jalo Ant-Wuorinen. Teknillinen Aikenkauslehti 21 : 444-445 (1931); C. A. 26:3106.—The residue of the sulphate cellulose process yielded a mineral of specific gravity 2.38. Microscopic examination showed it to be isotropic. Chemical composition was found to be: H_2O, 0.04 per cent; SiO_2, 55.88 per cent; Al_2O_3, 28.26 per cent; CaO, 0.73 per cent; MgO, 0.42 per cent; Na_2O, 16.36 per cent. The ratio of Si, Al and O was 2:1:1:3 and the mineral must then be a sodium aluminum silicate or zeolite. Methods are given for the formation of artificial zeolites from the was liquors. No specific reagent was found which would inhibit zeolite formation completely but compounds like sucrose were partially effective.—C. J. W.

Sulphite Process

Determination of sulphuric acid in the presence of SO_2 in burner gases. R. Schepp and K. Schiel. Papier-Fabr. 29, No. 48: 761-762 (Nov. 29, 1931).—The sulphuric acid is separted from SO_2 by filtration through asbestos and determined by benzidin according to Rashig or titrated with sodium hydroxide. Several experiments are carried out in order to prove the reliability of the method.—J. F. O.

Determination of SO_3 in the presence of SO_2 in burner gases. Erwin Schmidt. Papier-Fabr. 30, No. 12:133 (March 20, 1932).—A polemic regarding the method of SO_3 analysis in the presence of SO_2. Another writer refutes Schmidt's methods, but Schmidt proves that his method is accurate. In one method two gas volumes are used while the analysis is carried out on the same gas volume in the other.—J. F. O.

Investigation of burner gases. A. Bonisch. Zellstoff Papier 12, No. 3:114-115 (March, 1932).—The various methods for the analysis of the burner gases are briefly described. Then a new method is given in which the burner gases first pass through a solution of iodine and then through a solution of sodium hydroxide. The excess iodine is back titrated with sodium thiosulphate using iodate as indicator. Gases, other than SO_2 are tested from methods given.—J. F. O.

Determination of the free and combined sulphur dioxide in calcium bisulphite cooking liquors in sulphite pulp manufacture. G. Jander and K. F. Jahr. Z. angew. Chem. 44 : 977-980 (1931); C. A. 26 : 3105.—The total, free and half-free sulphur dioxide and the calcium content of sulphite liquor were determined by a single conductometric titration, when the liquor after oxidation with hydrogen peroxide was titrated with standard barium hydroxide solution. The titration curve has two breaks, the first corresponding to the neutralization point of sulphuric acid formed from the sulphurous acid and calcium bisulphite and the second to the end of the reactions $CaSO_4 + Ba(OH)_2 \rightarrow Ca(OH)_2 + BaSO_4$. The barium hydroxide used at the second break is a measure of the total sulphur dioxide; that used at the first break is a measure of the free and half-free sulphur dioxide; and their difference is a measure of the calcium bisulphite. Twice this difference subtracted from the barium hydroxide used as the second break is a measure of the free sulphur dioxide.—C. J. W.

Indirect sulphite cooking with forced circulation. A. St. Klein, Zellstoff Papier, 12, No. 4:149-152 (April, 1932).—Resume of the talk given by Skogstrom at a meeting of the Finnish Pulp and Paper chemists and engineers, in which the Brobeck system of forced circulation was thoroughly described. By means of several curves, the strength properties of the resulting pulps are shown, also the cooking curves are given. The steam consumption was 1.8 to 1.9 kilograms per kilogram of pulp, when the temperature of the acid was 28 deg. C. Sulphur consumption was 11 per cent. Wood consumption was 5.8 cubic meters per ton of pulp.—J. F. O.

Viewpoints on the circulation of sulphite liquor. Torsten Samson. Wochbl. Papierfabr. 63, No. 8:145 (Feb. 20, 1932).—An informal discussion, at a sectional meeting of the German society for pulp and paper, etc. of the more important factors concerning the circulation of the sulphite liquor.—J. F. O.

Process for the production of sulphite pulp. I. C. Farbenindustrie A. G. Frankfurt a.M. Ger. pat. 527,950 (Dec. 30, 1929).—The decomposition takes place in two successive cooks. The idea of the invention is to have the concentration of the cooking liquor stronger in the first than in the second. For example, a digester filled in the usual manner with spruce chips and a cooking acid of 5 per cent total SO_2 and 1 per cent CaO, is heated to 105. to 110 deg. C. and held at this temperature for 4 hours. Then all the acid is compressed out and the digester is filled with a pre-heated acid of 0.8 per cent total SO_2 and 0.25 per cent CaO. The digester is now brought up to 140 deg. and held at this temperature for 8-9 hours. It is then gassed. the liquor relieved and the digester contents washed, emptied and treated further in the usual manner.—J. F. O.

Process for the manufacture of high viscosity pulp. I. G. Farbenindustrie A. G. Frankfurt a.M. Ger. pat. 528,-042 (Jan. 17, 1930).—The process is characterized in that the cell membranes decomposed by the acid process, are purified by the exclusion of alkali. According to claim number 2, the purification means is formic acid. Claim number 3, the separation of the acid from the substance takes place by drenching with sulphur dioxide. An acid

or neutral bleaching is given before or after the above treatment.—J. F. O.

The removal of water and the purification of sulphite alcohol. W. Schmid. Wochbl. Papierfabr. 63, No. 6: 107-109, (Feb. 6, 1932).—J. F. O.

The reduction capacity of waste liquors. Hugo Lauber. Papier-Fabr. 29, No. 23a: 77-82, (June, 1931). —The influence of various mixtures on the capacity for reduction were investigated. Sulphur has no influence. There is an increase in the capacity for reduction with the addition of increasing amounts of selenium oxide, due to catalysis. Lower amounts of combined SO_2 favor the hydrolysis of hemicellulose, whereby the speed of hydrolysis counteracts the oxydative destruction of the sugar. There is no influence from AS_2O_3, or smaller amounts of Fe_2O_3 and $PbSO_4$.—J. F. O.

Formation of vanillin from sulphite cellulose waste liquors and its gravimeteric determination. M. Hönig and W. Ruzicka. Z. angew. Chem. 44 : 845-847 (1931); C. A. 26:3105.—Sulphite cellulose waste liquors, when boiled with sodium hydroxide, gives vanillin, which, after partial purification, can be determined as *m*-nitrobenzoylhydrazine. The yield is greatly decreased by passage of air during boiling, because of oxidation, and greatly increased by heating for 3 hours at 160-170 deg. and 5-6 atmospheres.—C. J. W.

Miscellaneous Digestion Processes

Process for the decomposition of substances containing cellulose, such as wood, straw and similar substances. I. G. Farbenindustrie A. G. Frankfurt a.M. Ger. pat. 528,129. Addition to pat. 500,567.—The raw materials are first treated with nitrogen oxides and then with air. For example, moist spruce wood is subjected for one or more hours to the action of nitric oxide, at 40 to 50 deg. C. obtained from the combustion of a mixture of ammonia and air in contact with a catalyser. It is then treated for 24 hours with air at 50 deg. The decomposition is complete and free from slivers.—J. F. O.

Beating

Breaker Beater. Homer D. Martindale assignor to The Black-Clawson Co. U. S. pat. 1,852,177 (April 5, 1932).—The invention provides a construction of the roll bearings designed to maintain the roll in proper operating relationship with respect to the beater tub and to prevent axial displacement of the roll.—A. P.-C.

Pulp Beater. William A. Bessmer assignor to Hammermill Paper Co. U. S. pat. 1,847,374 (March 1, 1932).—A coil spring is provided under each lighter bar for relieving the lighter bars of shock and effectively cushioning the movements of the bars, particularly when they "jump" on account of the passage of thick lumps of stock between the roll and bedplate.—A. P.-C.

Pulp Shredding Apparatus. Richard D. Kehoe. U. S. pat. 1,851,390 (March 29, 1932).—Moist pulp is shredded prior to drying completely by feeding it between pressing rolls which deliver it in a direction perpendicular to the tangent to the shredding roll, which travels at a much higher velocity than the sheet, so that the teeth deflect the unsupported portion of the sheet and pull off rather than cut off the pieces of pulp and at the same time effect partial separation of the fibers. The teeth have rounded rather than sharp ends, and are disposed in rows around the shredding roll, each row being offset relatively to adjacent rows.—A. P.-C.

Refiner. Frank J. Marshall assignor to Lucy G. Marshall. U. S. pat. 1,846,061 (Feb. 23, 1932).—This is an improvement on Marshall's U. S. pat. 984,830 of Feb. 21, 1911. The plug is formed with a number of grooves extending longitudinally and gradually increasing in width and depth toward the larger end. Between the grooves are secured plates having longitudinal ribs near the small end of the plug and angular pockets near the large end.—A. P.-C.

Pulp Beater. Edward B. Fritz. U. S. pat. 1,839,753, (Jan. 5, 1932).—Just behind the backfall of the main beater roll is an auxiliary beater roll, of smaller diameter and rotating at a higher speed than the main roll. The auxiliary roll co-acts with a circular bedplate extending over an arc of more than 90 deg. Both sides of the backfall of the auxiliary roll are perforated to act as a continuous extractor for pulp that has reached the required degree of subdivision.—A. P.-C.

Beater Roll. Daniel H. Shartle. U. S. pat. 1,838,875, (Dec. 29, 1931).—A series of attaching members or bars are fixed in dove-tailed slots in the peripheries of the spiders. A fly bar is rigidly attached to each side of each attaching bar, by means of pins passing through registering openings in the attaching bar and the two fly bars, respectively. The spaces between adjacent fly bars fixed to different attaching bars are filled by means of wooden filler blocks.—A. P.-C.

Refining and Circulating Device for Paper Stock. Joseph E. Bond. U. S. pat. 1,842,577 (Jan. 26, 1932).—An oblong tank is provided with a mid-feather or baffle extending from one end wall to near the opposite end wall, thus dividing the tank into two longitudinal channels communicating at one end. A screw or centrifugal pump has its inlet at the end of the tank on one side of the baffle and the discharge pipe at the same end but on the other side of the baffle. Mounted on the same shaft as the pump is a jordan, or similar refiner, which is constructed so that it operates as a centrifugal pump with fair efficiency; a portion of the circulated stock is therefore drawn into the refiner, from which it is discharged back into the tank (if batch treatment is used), or to some other apparatus (if continuous treatment is used). —A. P.-C.

Method of and Apparatus for Feeding Stock to Refining Engines or Fourdrinier Wires. James G. Ramsey assignor to Jessup & Moore Paper Co. U. S. pat. 1,844,794 (Feb. 9, 1932).—In order to eliminate lumps, froth and foam spots and produce a sheet in which the regulation of weight or thickness is expeditiously controlled, there is provided a stock box divided into several compartments, one of which is provided with an adjustable measuring wire, the stock being supplied to that compartment faster than it can flow out of the gate to the refiner. Means are provided to take care of the overflow from this compartment. The stock is thus supplied to both the jordan and the machine wire under a constant hydrostatic head, so that the flow is absolutely constant as compared with the usual fluctuations of pump pressure. —A. P.-C.

Contribution to the knowledge of stock and water economics for a paper machine. W. Brecht. Papier-Fabr. 30, No. 2: 13-17; No. 3; 25-29; No. 4: 38-46 (Jan. 10-24, 1932).—According to Schlater, stock with filler loses its water "freer" quicker on the wire than the same stock free from filler. The capacity for the removal of water increases with the rise in temperature. The density of the stock leaving the head box is the determining factor. The speed of the stock leaving the slice is always less than the speed of the wire. Numerous formulas are given for the various factors under control, for the different kinds of paper. Many line, as well as Sankey diagrams are added. A very comprehensive paper.—J. F. O.

Colorimetric Determination of pH of Solutions Containing Chlorine or Hypochlorites and the Stability of the Indicators*

By Harry F. Lewis[1] and Stephen I. Kukolich[2]

Abstract

While the action of chlorine and hypochlorites on colorimetric pH indicators has been recognized for some time, data has not been available to show in the case of the individual indicators commonly used, just what minimum amount of these materials impair the indicator accuracy. Because of the widespread use of colorimetric indicators, at times in the presence of chlorine and the hypochlorites, the following work has been carried out in order to make available this data. Both chlorine water and hypochlorite bleach solutions are reported and a series of indicators recommended for following the approximate pH changes during the course of a two-stage bleach.

Introduction

The maintenance of a predetermined hydrogen ion concentration and the colorimetric estimation as a control operation is a matter of considerable importance in the successful conduct of many industrial procedures. This is especially true in the pulp and paper industry.

The method most commonly used for the determination of the pH for all mill problems is the colorimetric method, in which two-color indicators of the type of the sulfonphthaleins are used and color comparisons made against standard color solutions of the LaMotte type or colored glass discs of the Hellige type.

In the absence of chlorine and the hypochlorites, such methods may be reasonably accurate. The greatest source of error seems to be in the indicator solution used in the determination. The colors of both the standard color solutions and the discs represent a color obtained when a definite quantity of the indicator solution of a determined pH is used under controlled conditions, with a given volume of solution of a definite pH. Obviously, an indicator solution of improper pH adjustment will give erroneous color values. Such improper adjustment may be the result of contamination of the indicator solution by one careless laboratory operator, or it may be due either to the incorrect adjustment of the pH of a replacement solution in the laboratory of the user or to the incorrect adjustment of the original solution sent out by the dealer. As an illustration, two solutions of phenol red in use in the laboratories of the Institute of Paper Chemistry gave pH readings of 7.2 and 7.6 respectively for the same solution. The actual value obtained with the glass electrode was 7.1, showing that the values obtained with one solution were .5 of a pH unit too high. To be absolutely certain, all indicator solutions, whether in original bottles or replacement solutions, should be adjusted to the correct pH by means of the hydrogen or quinhydrone electrode as a reference.

The full significance of hydrogen ion control in a number of operations in the pulp and paper process has not yet been established because of difficulties in the way of the use of the colorimetric method with solutions containing chlorine or the hypochlorites. This is the case, for example, in the control of the bleaching operation so as to secure the maximum bleaching and minimum cellulose degradation. To a lesser degree, it is important in the treatment of water for the control of slime by means of chlorine or chloramine, prior to the alum flocculation.

Chlorine appears to act on the usual chlorimetric indicators directly by substitution or indirectly by oxidation, the hypochlorites largely by oxidation. When chlorination occurs, hydrochloric acid is formed, which modifies the apparent pH of the solution. At the same time, the chlorinated indicator has a deeper color than the original indicator, and possibly a different pH color range.

The accurate measure of hydrogen ion concentration in the presence of chlorine or hypochlorite involves the use of the glass electrode by the method developd by MacInnes[3] and recently outlined by Rowland and Voigtman[4]. The method is not often used, partly because of the expense involved in assembling the necessary equipment and partly because of the fact that conditions in the usual mill laboratory are not conducive either to long equipment life or to exact physical measurement.

Statement of the Problem

In view of the widespread use of the colorimetric method for the determination of the hydrogen ion concentration even with solutions containing small amounts of chlorine, it seemed desirable to find out for each indicator just what smallest quantity of chlorine in a chlorine-water solution would impair the accuracy of that indicator. On the following pages is described this work with nine indicators, covering a wide pH range. With the hope that conditions during bleaching might favor the use of the most stable of these indicators for following pH changes during bleaching, single and two-stage bleaches were studied. The glass electrode has been used throughout for reference.

The method of investigating the relative stabilities of these indicators in chlorine-water solutions was simple. Chlorine-water solutions of known chlorine content and desired pH were prepared by passing chlorine gas into water of regulated original pH, which regulation was brought about by adding small amounts of either dilute hydrochloric acid or sodium hydroxide solution to distilled water. In this way, by a little practice, it was possible to prepare a chlorine-water solution of desired chlorine content and pH. For the estimation of chlorine present the chlorimetric method of Ellms and Hauser[5] was adopted when the chlorine content was less than 2 p.p.m.; chlorine contents greater than this were estimated by iodometric methods. The hydrogen ion concentration of the solution was determined with the glass electrode and colorimetri-

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cally my means of various indicators. In the latter case, the colors obtained were compared, where possible, with LaMotte color standards and the Hellige color discs. In case of the single-color nitrophenol indicators, these were not available, so a series of standard color solutions were prepared by the method of Michaelis and Gyemant[6].

The indicators studied included the following two-color indicators: brom thymol blue, phenol red, brom cresol green, brom phenol blue, and chlor phenol red. Single-stage indicators included: α-dinitrophenol, λ-dinitrophenol, p-nitrophenol and m-nitrophenol.

Orndorff and Black[7] who were responsible for a good deal of the early development among the sulfonphthaleins, recognized the difficulties encountered in using these indicators in presence of chlorine and suggested the use of the highly halogenated sulfonphthaleins. These and others are being investigated at the present time and will be reported at a later date.

Experimental Results

A. Relative Stabilities of the Indicators in Chlorine-Water Solution.

The indicators studied cover a wide range in pH values. In order to investigate all nine within their effective pH range and through the entire change in chlorine concentration, it was necessary to carry on four separate chlorination series.

Within any one series, the addition of chlorine caused a lowering in pH. By varying conditions, however, there may be obtained a chlorine-water solution of a pH of 5.0 and chlorine content of from 1 p.p.m. to 150 p.p.m. This is accomplished by varying the pH of the unchlorinated aqueous solution.

In the tables, the first point of noticeable chlorination of the indicator is marked by the symbol "—", and the first appearance of oxidation by the symbol "=".

1. Series I.

In the first series, an aqueous solution of pH 8.8 was prepared by the addition of a small quantity of sodium hydroxide solution. The particular indicator active within this range is m-nitrophenol. Others were included, but were not studied exhaustively. The results are listed in Table I.

TABLE I

THE STABILITY OF INDICATORS WITHIN A pH RANGE OF 8.8 — 3.4 AT CHLORINE CONCENTRATIONS UP TO 176 P.P.M.

p.p.m. Chlorine	Glass Electrode	m-Nitro-phenol	p-Nitro-phenol	α-Dinitro-phenol	γ-Dinitro-phenol
0.0	8.8	8.8			
.8	8.7	8.6			
2.0	8.6	8.6			
6.4	8.4	8.4			
10.1	8.4	8.3			
15.0	7.9	8.0			
18.0	7.8	8.0			
24.0	7.4	7.5 —			
42.0	7.0	7.4			
65.0	6.6	7.0	7.0		
77.0	6.5	7.0 =	6.9 —		
115.0	6.2	7.0	7.0		
140.0	5.5				5.5 =
165.0	4.1			4.2	
176.0	3.4			4.0 =	

m-Nitrophenol was first affected at 24 p.p.m. although there was little difference in behavior between this solution and the one containing 42 p.p.m. At 77 p.p.m., the color change was abruptly followed by a complete loss of the color. γ-dinitrophenol exhibited the bleaching action at approximately 140 p.p.m. while α-dinitrophenol was not thus affected until a chlorine concentration of 176 p.p.m. was attained. The effective pH range of ρ-nitrophenol was not reached until the chlorine content of the solution was so high as to interfere with the accuracy of the determination. Chlorination seemed to precede oxidation in every case, but as the chlorine concentration increased, the oxidizing action followed right behind the chlorination.

2. Series II.

In the second series, a water of pH 7.1 was used. This pH dropped to 6.4 upon the addition of 124 p.p.m. of chlorine. m-Nitrophenol is here compared with the three sulfonphthalein indicators,—phenol red, brom thymol blue, and chlor phenol red. The data are listed in Table II.

TABLE II

THE STABILITY OF INDICATORS WITHIN A pH RANGE OF 7.1—6.4 AT CHLORINE CONCENTRATION UP TO 125 P.P.M.

p.p.m. Chlorine	Glass Electrode	m-Nitrophenol	Phenol Red	Brom Thymal Blue
0.0	7.1	7.3	7.2	7.2
1.4	7.2	7.3	7.3 —	7.3 — =
3.0	7.2	7.3	7.4 =	
9.4	7.2	7.2		
14.3	7.1	7.2		
15.8	7.0	7.1		
30.5	7.0	7.1 —		
57.0	6.8	7.0		
125.0	6.4	7.0		

In the use of brom thymol blue, the oxidation and bleaching action appear to take place simultaneously. Only a slight color change was noted, which was very quickly followed by the bleaching effect. Phenol red, on the other hand, undergoes two distinct color changes before bleaching. The first color is a deep red, with a slight violet cast. The second change is blue violet. Bleaching took place rapidly at 3.0 p.p.m. Thiel[8] describes the effect of chlorine on phenol red as one of the direct halogen substitution into the side rings. The substitution of one halogen in the side ring produces a violet color, while the entrance of a second halogen in the same ring produces a blue-violet color.

3. Series III.

The third series was started at a pH of 6.9 in order that p-nitrophenol and chlor phenol red might be studied. The results are listed in Table III.

TABLE III

THE STABILITY OF INDICATORS WITHIN A pH RANGE OF 6.9—5.6 IN A CHLORINE CONCENTRATION UP TO 31 P.P.M.

p.p.m. Chlorine	Glass Electrode	p-Nitrophenol	Chlor Phenol Red
0.0	6.9	6.9	6.8
1.0	6.9	6.9	6.8 —
2.4	6.8	6.8	6.8 =
5.0	6.5	6.4	
10.0	6.3	6.3	
16.0	5.8	6.0 —	
21.0	5.7	6.0	
31.0	5.6	6.1 =	

p-Nitrophenol appeared to behave in much the same manner as did m-nitrophenol. The values obtained checked with those for the glass electrode until the chlorine concentration was between 10-15 p.p.m. Chlor phenol red, on the other hand, resembled phenol red (as was to be expected); chlorination occurred even at a chlorine concentration of 1 p.p.m, and oxidation of the indicator occurred when the chlorine concentration reached 2.4 p.p.m.

4. Series IV.

In this final chlorination, the remainder of the indicators was studied. Those included in this list are α-dinitrophenol, λ-dinitrophenol, brom cresol green, and brom phenol blue. The change in pH is fairly rapid in this region and it became necessary to raise the pH on two different occasions, with dilute sodium hydroxide, so as to be within the range of the remaining indicators in this one series.

TABLE IV

THE STABILITY OF INDICATORS FUNCTIONING BETWEEN A pH RANGE OF 5.4 — 3.6 IN A CHLORINE CONCENTRATION UP TO 71.0 P.P.M.

p.p.m. Chlorine	Glass Electrode	α-Dinitro-phenol	γ-Dinitro-phenol	Brom Cresol Green	Brom Phenol Blue
0.0	5.4	5.4	5.4	5.4	
1.0	5.5		5.5	5.5	
2.0	4.4		4.2	4.5 — =	4.6 — =
Addition of Sodium Hydroxide:					
3.5	5.0		5.0		
9.0	4.6		4.6		
14.0	4.2	4.0	4.3 —		
43.0	3.8	3.7 —			
71.0	3.6	3.7			
Addition of Sodium Hydroxide:					
68.0	4.5		4.7		

Brom cresol green and brom phenol blue behaved in the same manner as did the other sulfonphthaleins. Their use is impossible in aqueous solutions containing more than 2 p.p.m. of chlorine, for at that point they decolorize rapidly.

The nitro-phenols, on the other hand, are much more stable. While γ-dinitrophenol is good only up to 17 p.p.m., α-dinitrophenol may be used in chlorine concentrations up to 43 p.p.m. The main reaction occurring with the nitrophenols seemed to be that of oxidation, and, with increased chlorine concentration, there appears to be an increase in the velocity of the oxidation reaction.

B. Comparison of the pH Values of Bleach Solutions.

1. The Single-Stage Bleach.

The single-stage bleaching operation, as ordinarily carried out, consists in large part of a combination of lignin chlorination and lignin and carbohydrate oxidation. The oxidizing fraction of the bleach liquor equilibrium mixture is used up at a more rapid rate than is the free chlorine, thus lowering the chlorine concentration of the equilibrium mixture; at the same time, the pH of the resulting solution is decreased by the hydrochloric acid liberated in the lignin chlorination along with the acid formed as the result of oxidation. Under the conditions existing in the bleach liquor, p-nitrophenol may be used to indicate hydrogen ion concentrations in the presence of not more than 200 p.p.m. of available chlorine. However, at this point, the bleach liquor is assumed to be completely exhausted. The reading must be carried out in a small fraction of a minute; otherwise, the indicator itself is "bleached." Sulfonphthalein indicators are absolutely valueless even in the so-called exhausted liquor.

The data on a single-stage bleach, in which 27% bleach was used at a temperature of 34° Centigrade, are listed in Table V. The material bleached was a kraft pulp.

TABLE V

THE USE OF COLORIMETRIC INDICATORS IN FOLLOWING CHANGES IN pH OF A SINGLE-STAGE BLEACH

p.p.m. Chlorine	Glass Electrode	m-Nitrophenol	p-Nitrophenol	Time in Hours
11,000	8.9	...	...	0.0
3,000	6.8	...	...	1.5
2,000	6.5	...	...	2.5
1,500	6.5	...	...	3.0
1,300	6.5	...	...	3.5
1,000	6.2	...	...	5.0
600	6.0	...	...	7.0
200	6.0	...	6.1	9.0

The data indicate the unsatisfactory results obtained in following pH changes in a single-stage bleach by chlorimetric methods. The glass electrode is the only means available for the satisfactory determination of pH under these conditions.

2. The Two-Stage Bleach.

The two-stage bleach followed here was equivalent to a single-stage bleach in which 18% bleach was used, 13% in the first stage and 5% in the second. The first stage was carried out by a direct chlorination; this was followed by an alkaline wash, after which came the second stage, using bleach liquor. The first stage took 20 minutes and the second 4½ hours. Samples were taken every 5 minutes during chlorination.

TABLE VI

THE USE OF COLORIMETRIC INDICATORS IN FOLLOWING CHANGES IN pH DURING A TWO-STAGE BLEACH

	FIRST STAGE				
p.p.m. Chlorine	Glass Electrode	m-Nitrophenol	α-Dinitrophenol	p-Nitrophenol	Time in Minutes
0	7.7	7.6	...	...	0
120	5.9	...	...	6.1	5
140	2.5	...	2.7	...	10
150	2.2	...	2.4	...	15
160	2.0	...	2.3	...	20

The pH reading after the alkaline treatment was 10.5, which was taken roughly from readings on the glass electrode.

The three readings using m-nitrophenol were made as rapidly as possible. It is interesting to note that the oxidizing action of the bleach solution under these conditions is less than that of the chlorine-water of the same available chlorine concentration. In the same way, readings with p-nitrophenol were possible at a chlorine concentration of 70 p.p.m., while the chlorine-water along 16 p.p.m. of available chlorine were enough to spoil the end point. Whatever the reason, this fact makes possible an approximate determination of pH changes during the second stage of this type of a bleaching process, while the acid side of the first stage may be followed with fair accuracy with p-nitrophenol and α-dinitrophenol.

	SECOND STAGE			
p.p.m. Chlorine	Glass Electrode	m-Nitrophenol	p-Nitrophenol	Time
700	8.6	..	..	0
560	8.3	8.5	..	15 min.
420	8.0	8.2	..	30 min.
350	7.9	8.0	..	1 hour
280	7.5	..	..	2 hours
210	7.2	..	..	3 hours
70	7.0	..	7.0	4 hours
...	6.9	..	7.0	4.5 hours

At this point, it should again be emphasized that to one accustomed to the two-color indicators, these single-color indicators may seem hard to use. When the operator has become accustomed to the slight color changes and has a satisfactory set of standards, good results may be obtained. Based on the above data, it will be seen that principal changes in the first stage of the above two stage process may be followed first by p-nitrophenol and then with a-dinitrophenol, while the second stage is followed by m-nitrophenol and then by p-nitrophenol. Such a method is cumbersome but for preliminary investigations, may be used. The glass electrode is to be recommended as the method of primary value.

Summary and Conclusions

A. Experiments have been carried out to establish the maximum chlorine content in a chlorine water solution which will not interfere with the accuracy of a colorimetric hydrogen ion determination. The indicators studied include five of the sulfonphthalein type and four of the nitrophenol type, while the reference instrument has been the glass electrode.

B. The data indicate that the sulfonphthalein indicators will not function at a chlorine content greater than 2 p.p.m. This amount is above the amount commonly used for slime control, although it is considerably less than that recommended in a recent paper. However, unless the sample used for pH determination is taken after complete mixing of the chlorine, sufficient of the latter may be present to invalidate the determination.

C. The nitrophenol indicators, on the other hand, will stand considerably greater concentrations of chlorine; in fact, they are well adapted for the determination of the pH in the case of almost any type of slime control.

D. The pH changes in a single-stage bleach operation cannot be followed with any of the colorimetric indicators studied. The glass electrode is the only available method of following these changes accurately.

E. Changes in the two-stage process may be followed with some success by means of the nitrophenol indicators. These may be used in bleach liquors in the presence of much higher chlorine concentrations than would be possible in chlorinated water. When this is done, it is necessary to carry out the color comparisons in a very short space of time. The most satisfactory method for following these changes is the glass electrode.

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Drying of Pulp and Paper—I*

Mechanism of Air Drying

D. W. McCready[1]

Summary

The water in a solid is divisible into free water which can exert its full vapor pressure and bound water which is held by the solid by means which reduce its vapor pressure below that of free water at the same temperature. Free water is readily transferred through the solid as liquid water but no appreciable quantity of bound water is transferred as liquid water during the drying process. Two mechanisms of drying have been found for the air drying of pulp and paper, first, evaporation of water at the surface of the solid when the flow of free water is sufficient to maintain the equivalent of a film of water on the surface, and second, evaporation of water in the interior of the solid as the flow of free water decreases. The rate of drying is dependent upon the conditions of the drying air and the permeability of the dried solid to water vapor and is not a direct function of the water content of the solid. Drying data on pulp slabs of varying permeability to water vapor are presented as proof of the two mechanisms of drying and also illustrate the effect of permeability on the water distribution in the solid. The types of shrinkage occurring during the drying process are explained. The effects of drying on the physical properties of finished paper are briefly mentioned.

Introduction

The object of studies of drying processes is to obtain data upon which to base the design and operation of drying equipment so as to be able to economically dry solids with least injury to the final product. The drying processes of the pulp and paper industry present a large field for the application of fundamental drying information because of the types and extents of the processes, the classes of materials dried and the effect of the drying process on the properties of the final products.

The design of drying equipment for the paper industry has been based on the results of previous installations or rule of thumb methods. Very little information is available for design purposes. Many schemes of improving the drying processes have been exploited but very few of these are fundamentally correct or applied to the parts of the processes needing improvement.

The effect of the drying process on the properties of finished paper is of great concern for defects such as curl, cockle, etc., must arise in the drying process regardless of the condition of the plastic web entering the drier. Proper sizing of the paper depends upon optimum conditions of temperature, water content and acidity in the paper at some point in the drying process. Regardless of how expertly materials have been prepared and formed into the wet web the extent to which this care is realized is dependent upon the drying process and increased quality of raw material may not result in either immediate or permanent increase in the physical properties of the finished paper.

It is the object of this series of papers to present the fundamentals of the drying processes of the pulp and paper industry and the effect of variables on them, the formulations of the drying processes and the effect of drying on the properties of the products.

Air Drying of Solids

In the process of air drying the water of the solid vaporizes and diffuses from the solid into the air stream, which supplies the heat required for the process and is the carrier for removing the water vapor. As a temperature gradient is necessary for the flow of heat the solid will always be at a lower temperature than the air during the drying process. The diffusion of water vapor requires a vapor pressure gradient between the solid and the air. The vapor pressure of water in air depends upon the water content of the air and the relations are known from wet and dry bulb thermometry. The vapor pressure of water in the solid, liquid water being present, depends upon the temperature of the solid as defined by the known relations of temperature and vapor pressure. Some materials bind water by means which reduce its vapor pressure. The amount of water bound depends upon the relative humidity of the air in contact with the material and is called hygroscopic moisture.

The Drying Curve

Drying data are most satisfactorily presented as a plot of the instantaneous rate of drying versus the average water content of the solid. These plots readily show the effect of variables on the drying process and can be integrated to determine the total time required to dry the solid between limits of water content. The drying curve of a solid initially saturated with water is divisible into two intervals. During the first the rate of drying remains constant as the average water concentration of the solid decreases and it is immediately followed by an interval in which the rate of drying decreases as the average water content of the solid decreases. These are designated intervals of constant and falling rate drying, the break in the curve between them is called the critical point, and is expressed as the average water content of the solid at that point. Studies of the drying processes are chiefly concerned with the interval of falling rate drying.

Previous Work on the Mechanism of Drying

Many investigators have presented data on drying processes but the important hypotheses on the drying mechanism and formulations of the processes are those advanced by Lewis[4,7] and Sherwood.[6] Four possible mechanisms of drying are postulated and their characteristics given.

I. Saturated Surface Drying. The flow of water within the solid keeps the surface saturated so the equivalent of a film of water is presented to the drying air. The mechanism of drying is similar to the evaporation of water from a water surface which is well understood.[2,7] All factors remain constant so the rate of drying is constant. This is the mechanism of drying in the interval of constant rate drying.

II. Unsaturated Surface Drying. The flow of water

TAPPI Section, Page 125

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in the solid is sufficient to keep the hollows in the surface saturated with water the high points being dry. The rate of drying decreases in proportion to the decrease in saturated area. The overall coefficient of heat transfer remains constant and equal to the value in the interval of constant rate drying indicating that water is evaporating at the surface of the solid.

III. Rate of Liquid Water Diffusion Through the Solid the Controlling Factor. Water is evaporated at the surface of the solid as rapidly as it can diffuse to the surface from the interior. The rate of drying decreases as the rate of diffusion of liquid water decreases and the latter is a function of the thickness of the sample.

IV. Evaporation of Water in the Interior of the Solid. The zone of vaporization of water is in the interior of the solid and its location depends upon a balance of the rate of flow of water into and the water vapor out of it. The rate of drying and the overall coefficient of heat transfer decrease and a layer of dried solid is formed beneath the surface, as the zone of vaporization retreats into the interior of the solid.

Discussion of the Mechanisms of Drying Postulated by Lewis and Sherwood

Of the four mechanisms postulated there is conclusive evidence for only mechanisms I and IV. It can be reasoned from the inevitable heat and material balances which must hold at the surface of the solid that drying by mechanism II could not continue for an appreciable length of time. Mechanism III and mechanism IV are essentially alike, the difference that might distinguish them being the permeability of the dried solid to water vapor. Sherwood has mentioned that III applies to relatively non-porous materials and IV to porous materials but does not suggest at what porosity the mechanism changes.

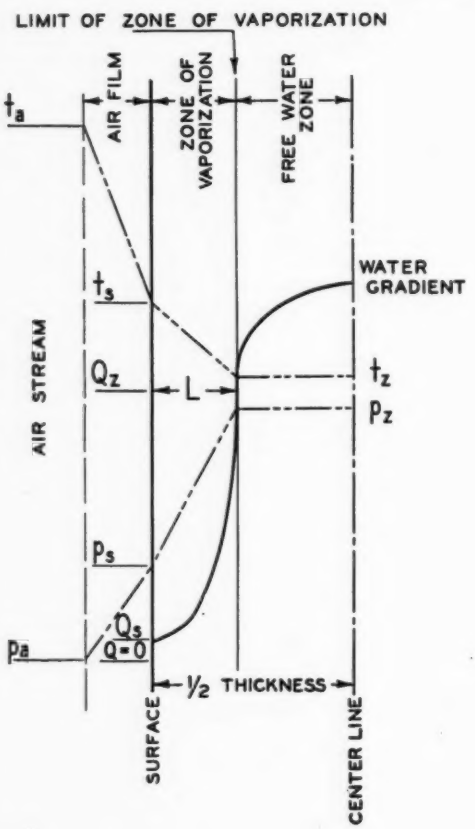

Fig. 1.
Diagram of the mechanism of evaporation of water in the interior of a slab.

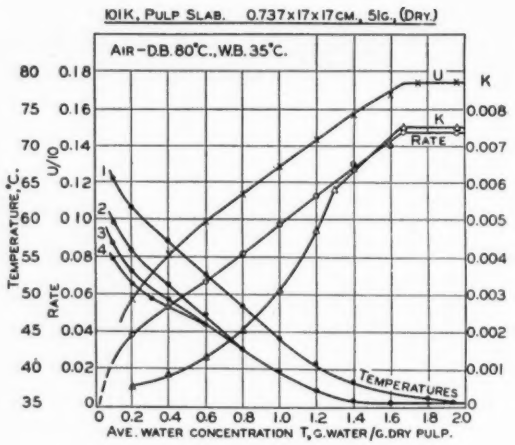

Fig. 2.
Drying data on porous pulp slab.

The drying curves of solids relatively impervious to water vapor such as soap and wood have been used by Sherwood in support of the hypothesis that all of the water in the solid is transferred as liquid water by a diffusional process and, consequently, the rate of its transfer is a function of the thickness of the sample. It is shown later in this paper that only part of the water of the solid is transferred as liquid water and that the rate of liquid water transfer is not primarily dependent upon the thickness of the solid and can be considered capillary transfer.

Classes of Water in the Solid

The classes of water in the solid have not been considered in previous hypotheses on the drying mechanism. Water may be present in the solid as liquid water in the pores of the solid, on the surfaces and in the interiors of the particles of the solid and as solution or hygroscopic moisture. For the purposes of the drying process the total water in the solid may be divided into three classifications, free, bound and equilibrium. Free water in the solid can exert its full vapor pressure. Bound water is water held by the solid and its vapor pressure is reduced below that of free water at the same temperature. The amount of bound water may be the summation of several of the above but the minimum quantity will equal the amount of hygroscopic moisture of the solid. The ultimate water content of the sample in contact with the drying air is called the equilibrium water.

The minimum quantity of bound water can be obtained from the water content-relative humidity curves for the material. Usually these curves are absorption curves that is the amount of water absorbed by the material when exposed in an initially dry condition to the humid air. When the material is initially saturated with water a similar curve is called a desorption curve and it gives higher values of equilibrium moisture. In formulating the drying process the desorption curve must be used. Absorption and desorption curves of paper pulp have been published.[5]

Mechanism of Evaporation of Water in the Interior of Solid

The mechanism of evaporation of water in the interior of a slab is diagrammed in Fig. 1. One half of the slab

is represented as conditions on sides of the centerline are identical if both faces of the slab are exposed to the drying air. The temperatures, vapor pressures and water concentrations are represented as ordinates and the distances from the surface to the center line of the slab as abscissa. On the surface of the slab is a relatively stagnant film of air regardless of the turbulence of the air stream. Heat and water vapor are transferred between the air stream and the zone of vaporization against resistances encountered in the air film and dried solid. The limit of the zone of vaporization is a distance L inside the surface of the solid.

Heat flows from the air to the limit of the zone of vaporization under a temperature difference $(t_a - t_z)$, the portion of the difference necessary to overcome the resistance of the air film being $(t_a - t_s)$ and the portion for the dried layer of solid $(t_s - t_z)$. Water vapor flows from the limit of the zone of vaporization under a partial pressure of $(p_z - p_a)$ and the individual differences are $(p_s - p_a)$ and $(p_z - p_s)$ for the air film and the dried layer of solid. The water concentration rises from Q_s at the surface to Q_z at the limit of the zone of vaporization and continues along the line indicated to the centerline. Q_z equals the water content of the material in contact with a saturated atmosphere under the conditions of the drying process. The values of Q between Q_s and Q_z are the water contents of the material in equilibrium, under the conditions of the drying process, with the values of p/p_z between p_s and p_z.

In the zone of vaporization only bound water is present. Inside the limit of the zone of vaporization the bound water equals the water under the concentration ordinate Q_s and the free water that above this concentration. The free water is transferred through the solid into the zone of vaporization by capillarity, the rate of its transfer being a function of its concentration. No appreciable quantity of bound water is transferred through the solid in liquid form during the drying process. The amount of bound water in the zone of vaporization is a function of the distribution of the vapor pressure through the zone and will vary with the permeability of the dried solid.

Location of the Limit of the Zone of Vaporization

Free water could not exist in the zone of vaporization as it would be at a higher temperature and vapor pressure

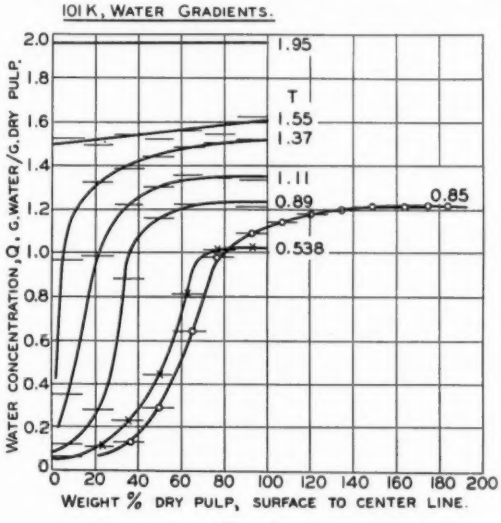

FIG. 3.
Water gradients in porous pulp slab during drying.

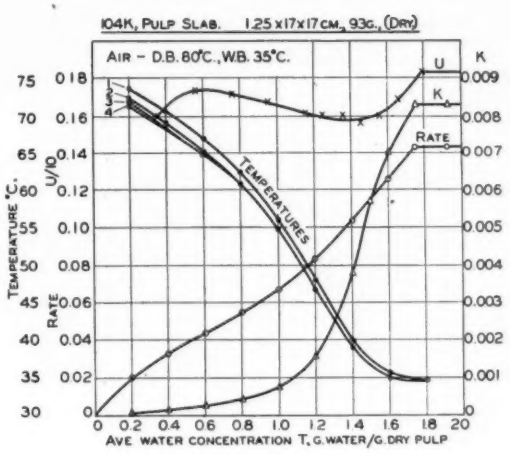
104K, PULP SLAB. 1.25 x 17 x 17 CM., 93C., (DRY)
AIR – D.B. 80°C., W.B. 35°C.
U
K
RATE
TEMPERATURES
TEMPERATURE °C.
U/D
RATE
AVE WATER CONCENTRATION T, G. WATER/G. DRY PULP
0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

FIG. 4.
Drying data on medium porous pulp slab.

than the water within the limits of the zone of vaporization and consequently would diffuse, as water vapor, back to the free water zone. Also all points in the free water zone must be at the same temperature. The limit of the zone of vaporization therefore is at the edge of the free water zone the location of which depends upon the rate at which free water is transferred through the solid.

The Formulation of the Drying Mechanism

The formulation of the drying mechanism can be based on the rates of flow of heat and water vapor between the air and the zone of vaporization or on the rate of transfer of liquid water through the solid. Such formulations are of little value as they do not formulate the rate of drying as a function of the water content of the solid. Attempts have been made to formulate the drying process as a function of the water gradient through the solid but there is little possibility of satisfactorily doing so as the rate of drying is dependent upon the magnitude of the vapor pressure gradient and the water gradient through the solid is dependent upon the distribution of the vapor pressure and the hygroscopic properties of the solid. The drying curve is merely a satisfactory method of presenting drying data and cannot be considered as expressing the rate of drying as a dependent function of the water content of the solid.

It is possible from the preceding to predict the effect of variables on the drying process but only the effect of density on the mechanism of drying is considered in this paper. Increasing density or decreasing permeability of the solid for water vapor results in changing the distribution of the vapor pressure through the zone of vaporization.

Experimental Procedure

The drying samples were built up of two or more plies of kraft pulp formed on a laboratory sheet machine. Thermocouples were inserted between plies and the whole was pressed to form a compact sample of the desired properties. The edges were heavily coated with collodion to limit the drying area to the faces. Similar samples but without thermocouples were used to determine the water gradients, the samples being removed at progressive stages of the drying process, the plies separated and analyzed for water.

The samples suspended from the arm of a balance hung in a large drying cabinet in a turbulent stream of conditioned air. This method prevented localized drying on the edges leading into the air stream and minimized heat radi-

ation to the samples. The thermocouple leads were in an isothermal plane with the junction for at least a length of 7 cm.

The data taken was a weight time curve on the sample and readings of the temperature of the sample. The differentiated weight time curve plotted versus the average water concentration of the sample is the drying curve.

Drying Curve of a Porous Pulp Slab

A drying run on a very porous pulp slab is plotted in Fig. 2. The following values are plotted versus the average water concentration of the slab.

Rate—The rate of drying in grams of water evaporated per hour per sq. cm. of drying area.

Temperatures—The temperatures in the sample, the thermocouples 1 to 4 being located respectfully 1.5, 28, 57 and 85 per cent the distance from the surface to the centerline.

U—The overall coefficient of heat transfer.

K—The overall coefficient of vapor diffusion.

In Fig. 3 the water gradients at stages in the drying process are plotted. The average water content of the sample is given at the right of the curve and the extended curve is for a slab 190 per cent as thick as the sample used in the drying run. It is evident that evaporation is taking place in the interior of the slab for at an average water content in the slab of approximately 0.5 grams of water per gram of dry pulp one half of the sample was practically dry while the center half contained approximately 1.0 grams of water per gram of dry pulp.

The intervals of the drying curve are evident in Fig. 2, the constant rate interval from T = 2.0+ to T = 1.67 and the remainder the falling rate interval. The critical point is at T = 1.67. During the constant rate interval the rate of drying, overall coefficients of heat and water vapor transfer and temperatures in the sample remain constant the latter at the wet bulb temperature of the drying air.

During the interval of falling rate drying all of the above values decrease except the temperatures in the slab which increase. The decreasing overall coefficients indicate an increasing length of path air to the limit of the zone of vaporization which to satisfy this condition must be retreating into the interior of the slab. The important change is the temperature gradient in the slab. From

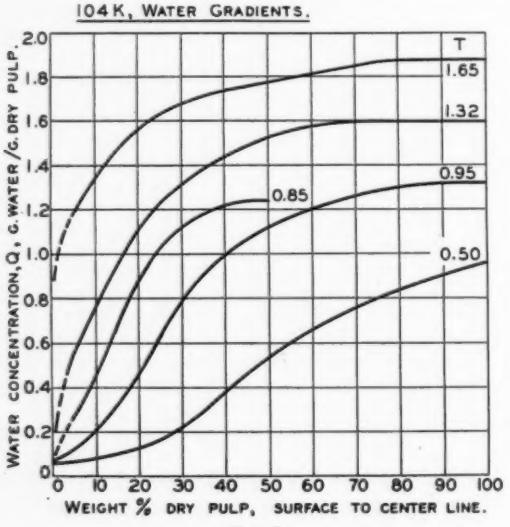

FIG. 5.
Water gradients in medium porous pulp slab during drying.

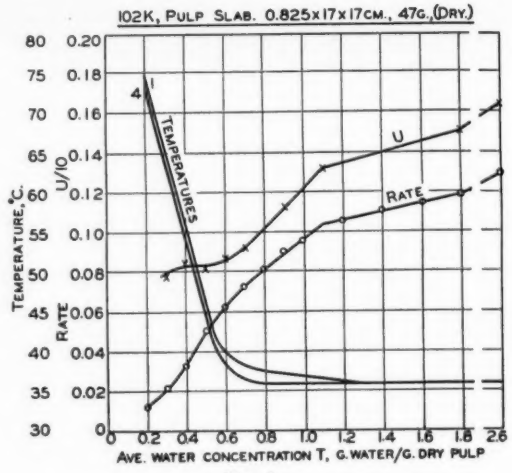

FIG. 6.
Drying data on relatively non-porous pulp slab.

T = 1.4 to T = 0.75 there is a temperature gradient between the surface and the position of the second thermocouple. The temperature gradient extends deeper into the slab as the drying process proceeds reaching the fourth thermocouple at T = 0.55. This is positive proof of vaporization of water in the interior of the slab as it was shown that liquid water could not diffuse against a temperature gradient.

Fig. 3 shows a uniform water concentration through the slab before the critical point. Immediately after the critical point the surface layers of the slab dry out. This is not indicated in the gradient curve for an average water concentration of 1.55 as it was impossible to separate the surface plies before water was conducted into them but observation showed that the surface was dry after the critical point. The center of the slab retains a relatively high but decreasing water content. The free water in the center is transferred to the zone of vaporization the limit of which must be located approximately at a plane in the slab where the water gradient is the steepest. The limit of the zone of vaporization can be approximately located by the temperature gradient. At an average water concentration of T = 0.60 the temperature gradient extends to the location of the third thermocouple which is approximately 60 per cent of the distance from the surface to the centerline. Referring to Fig. 3 it is evident that when the average water content of the sample equalled T = 0.60 that the water concentration in the pulp at a plane approximately 60 per cent of the distance from the surface would approximate 0.80 — 1.00 grams of water per gram of dry pulp. This approximates the bound water content of the pulp in contact with a saturated atmosphere so the limit of the zone of vaporization is at the edge of the free water zone.

Drying of Pulp Slabs of Decreasing Porosity

The pulp used for the previous run was beaten to reduce the aggregate size of the fibers and two drying runs were made on samples which gave less porous slabs. The initial densities on a dry basis were approximately the same. The porosities of the samples can best be expressed by comparison with commercial materials.

Run 101K—porous slab, similar to blotting paper.

Run 104K—medium porosity, similar to bond paper.

Run 102K—non-porous, similar to parchment.

The drying data of run 104K is plotted in Fig. 4 and 102K in Fig. 6, and the water gradient curves in Figs. 5

and 7. Identical procedures were used in all runs and the same values plotted.

Discussion of Run 104K

In general the curves are similar to those for the porous slab the most apparent differences being the constancy of the overall coefficient, U, and the magnitude and shape of the temperature curves. Immediately after the critical point the overall coefficients decrease but the overall coefficient of heat transfer later increases. K continues to decrease indicating an increase in the length of path, air to the limit of the zone of vaporization. It is doubtful if U increases but at least it decreases only slightly. The small change is explained by the fact that of the specific coefficients comprising U the air film coefficient is of greatest significance, as indicated by the ratio of the temperature drops through the air film and the slab. This ratio increases as the density of the solid increases due to the increase in the thermal conductivity of pulp slabs with density.

An increase in the density of the slab increases the impermeability of the slab to water vapor. In solids of increasing density or in solids where the permeability of the dried layer varies, decreasing from the limit of the zone of vaporization to the surface due to shrinkage, the vapor pressure will be relatively greater at any plane in the zone of vaporization. This would result in a greater bound water content in the slab in the zone of vaporization or water gradient curves less concave upwards. This is indicated in the water gradient curves of this run relative to the preceding run.

It is evident that for the decrease in porosity as represented by Sample 104K relative to the porous Sample

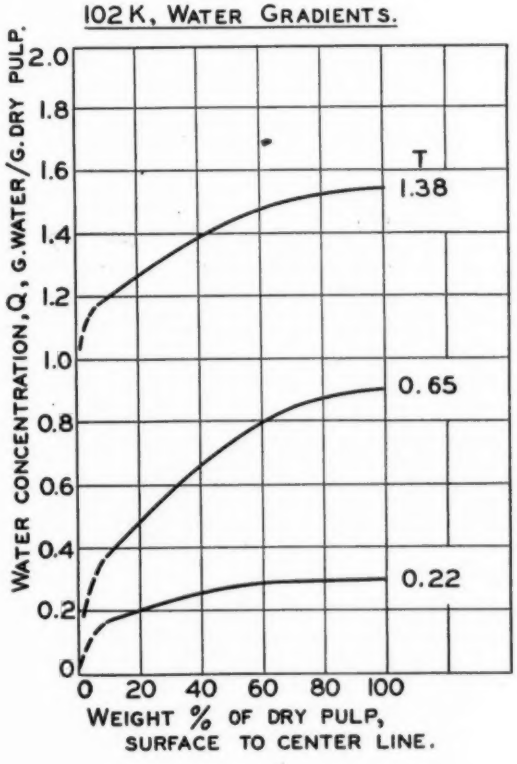

FIG. 7.
Water gradients in relatively non-porous pulp slab during drying.

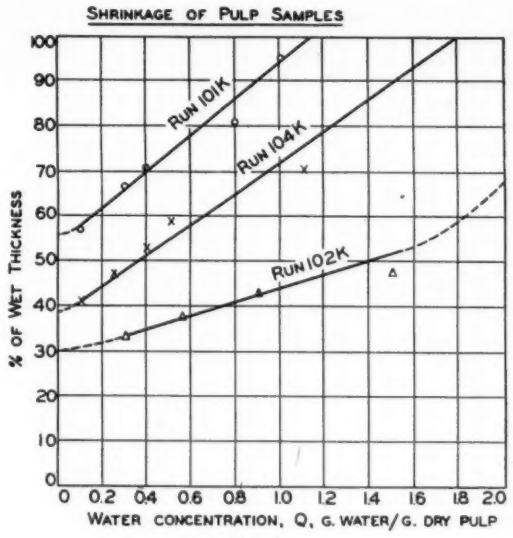

FIG. 8.
Shrinkage of pulp slabs during drying.

101K there has been no change in the mechanism of drying. The limit of the zone of vaporization must be in the interior of the slab because of the temperature gradient through the slab. The value of the overall coefficient of heat transfer has remained practically constant and equal to the value in the interval of constant rate drying, this fact being previously used as proof of evaporation of water at the surface of the solid.

Discussion of Run 102K

The curves obtained are similar to those of 104K and the differences found between 101K and 104K being magnified in this run. No constant rate interval is indicated as the rate of drying was calculated using the face area of the wet sample. Shrinkage during drying decreased the drying area and curled the sample. Approximate corrections for this shrinkage indicate an nterval of constant rate drying extending to $T = 1.1 - 1.2$.

The important conclusion from this run is that for this relatively non-porous sample the mechanism of drying is still that of evaporation in the interior of the slab because of the temperature gradient through the slab. Ordinarily this sample would be considered as an example where mechanism III of Sherwood would apply. The water gradients, which are concave downwards because of the impermeability of the dried solid, are typical of the gradients considered as controlling the rate of drying in the formulation of mechanism III by Sherwood.

Drying of Asbestos Slabs

Slabs made from asbestos fibers were run in conjunction with the pulp slabs. The results were identical when allowance is made for the very small bound water content retained by this practically non-hygroscopic material.

Shrinkage of Pulp Slabs

The decrease in the drying area during the drying process for runs 101K and 104K was very small, about 6 per cent, and had little effect on the drying curves. With larger samples the shrinkage in drying area is proportionally less.

Shrinkage normal to the drying faces is of greater magnitude. In Fig. 8 shrinkage data taken from the plies used in determining the water gradients are plotted. There

was little decrease in the thickness of Sample 101K until the water concentration in the pulp approximated the maximum bound water concentration of the pulp. In this sample the fibers were rigid and were not drawn together as the free water was removed. This left a porous structure so air could replace the water removed. The shrinkage taking place below Q = 1.2 is most likely due to the shrinkage of the individual fibers as they dry out that is the bound water is removed.

In run 102K the greatest part of the shrinkage of the sample occurred while the sample still contained free water. In this sample the fibers were greatly reduced in size and rigidity and as the free water was removed they were drawn together. After Q = 1.1 the amount of shrinkage on the basis of original dimensions was less than for run 101K but on the basis of the dimension of the sample at Q = 1.1 approximates the shrinkage found for run 101K. This indicates that shrinkage due to the shrinking of the individual fibers is practically constant regardless of the size of the fibers.

Shrinkage can be divided into two classes,

I. Shrinkage due to the collapse of the structure of the solid as the free water is removed. The amount of this shrinkage may equal the total volume of free water removed or less.

II. Shrinkage due to the shrinking of the individual particles of the solid as they lose their bound water content. This case is limited to materials which change in dimension with the amount of hygroscopic moisture held.

Effect of Drying on the Properties of the Product

Shrinkage of the solid changes the solid fraction of the solid and the effect of solid fraction on the physical properties of finished paper has been presented.[3] Evidently the strains causing curl, cockle, warping, etc., arise from this shrinkage. Proper sizing of paper requires that optimum conditions of temperature and acidity be reached while the paper still contains free water. The sizing process must be completed at the limit of the zone of vaporization and therefore depends upon proper conditions at this limit. The effect of beating and drying on the solid fraction of the finished sheet is evident and presents new information on the functions of the beating process and the effect of beating on the drying process.

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Holyoke Reports Improvement

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., September 13, 1932.—Paper manufacturing business in Holyoke is on the upgrade, generally speaking, though the increase in orders is not distributed evenly. During the past month there has been slight improvement to considerable improvement along the line but business is yet far, far from normal. Paper converters expect better times shortly. Holyoke's wage schedule increased about $28,000 last month over the month previous, but this includes other than the paper industry. Future developments will soon determine whether the increased business is merely seasonal or the beginning of better times.

TAPPI SECTION, PAGE 130

New Book on Research

"Profitable Practice in Industrial Research" edited by Malcolm Ross, a book recently published by Harper & Brothers, was prepared under the auspices of the National Research Council, Division of Engineering and Industrial Research, is now available and may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 370 Lexington Avenue, New York, at $4 per copy.

The past decade has seen the number of industrial research laboratories grow from 500 to 1,600 and the scientific output from these laboratories has been further increased by the contribution from a large number of technical institutes and universities. Some of the great American corporations were literally born in the laboratory. Today there is no industrialist of importance who has not accepted research with enthusiasm.

The object of the book is to present the accumulated experience of the past twenty-five years in American research. Each of the fourteen chapters are written independently by outstanding leaders in the field of research such as the following:

Practical Application of Industrial Research by Frank B. Jewett, president of the Bell Telephone Laboratories.

Trouble as an Approach to Research by Charles F. Kettering, vice president, General Motors Corporation.

Organization of a Research Department by C. E. Kenneth Mees, Eastman Kodak Company.

Getting Laboratory Results into Factory Production by C. E. Skinner, Westinghouse Electric and Manufacturing Company.

Fundamental and Applied Chemical Research by C. M. A. Stine, vice president, E. I. duPont de Nemours Company.

Trade Association Research by Witham, Sparagen, National Research Council.

The Consulting Laboratory by Arthur D. Little.

Selecting Research Laboratory Workers by John Mills, Bell Telephone Laboratories.

Bureau of Standards Cooperation in Industrial Research by George K. Burgess.

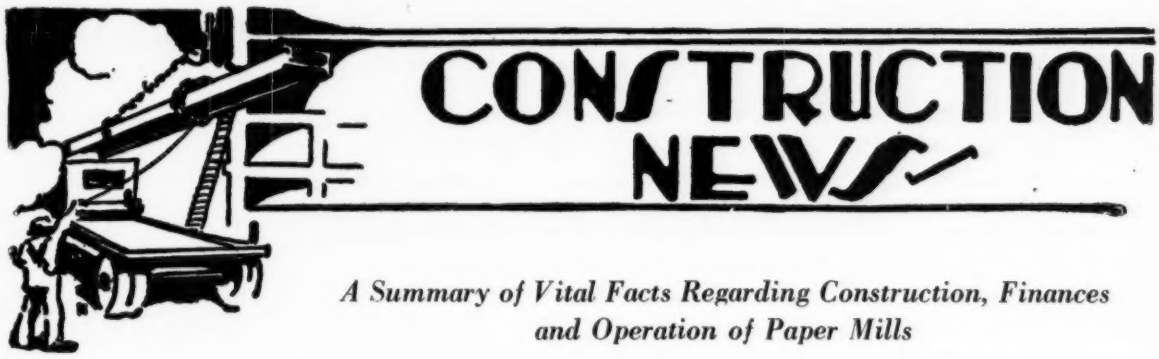
Each chapter is closed with an excellent summary by the author.

Research is to industry what fire insurance is to the merchant. It may overnight provide a new material, process or product which may change existing industries or create new ones.

Tarentum Mills Complete Improvements

Tarentum Paper Mills have just completed several changes made in their power plant, as well as in other parts of their mill. They have put into operation their No. 2 machine, which had been idle for several years past. They are also resuming operations in their bag factory, which they have not been running for some time, and which is equipped to make heavy duty bags.

Since coming to Tarentum, R. B. Livermore, the new general manager, has developed several special papers, one of which is a rope saturating paper for the artificial leather converter, and which they make in thicknesses from .007 to .025. Another one is a bleached kraft sheet to meet the demand for a medium priced paper in the folder and tag trade, and which is carried in stock in sheets size 22½ x 28½ and 24 x 36 in thicknesses ranging from .007 to .015.



A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Sturgis, Mich.—The Harvey Paper Products Company has work in progress on an addition to local mill, and will equip unit for increased capacity for manufacture of paper products for the food trades. Expansion is reported to cost over $25,000, with equipment.

New York, N. Y.—The Alling & Cory Company, 25 Verona street, Rochester, N. Y., paper products, has leased ground floor, basement and second floor in building at 133-44 West Twenty-first street, New York, totaling about 30,000 square feet floor space, and will occupy for new branch storage and distributing plant, and local headquarters. Present branch at 317 West Thirty-seventh street, will be removed to new location.

Bogalusa, La.—The Union Bag & Paper Corporation has adopted a capacity production schedule at local mill, with night shift in addition to regular day working force. Company is said to have secured large orders and will continue on new basis for an indefinite period.

Brooklyn, N. Y.—The Jacoby-Narce Corporation, recently organized by Samuel Smith, 1335 East Twenty-first street, Brooklyn, and associates, with capital of 20 shares of stock, no par value, plans operation of local plant for manufacture of paper boxes and containers. Morris Gelber, 16 Court street, and Dominick Corso, 76 Wilson avenue, both Brooklyn, are interested in new company.

East Walpole, Mass.—Bird & Son, Inc., manufacturer of paper roofing, press board and kindred products, is said to have plans for a new one-story building at main local mill, to be 80 x 84 feet, designed for paper storage and distributing service. Unit will have capacity for handling about 1200 tons of paper stock at one time. Installation will include a traveling crane and other handling equipment. A monorail system will connect the new building with the basement of No. 1 box shop at the plant. Estimated cost of new building has not been announced.

York, Pa.—The United Wall Paper Company has resumed production at local mill, following shut down of several months. The company is said to have booked sufficient orders to insure continuance of manufacture for some weeks to come. About 400 persons have been reinstated.

Albany, N. Y.—The Capital City Container Company, Inc., lately chartered by local interests, represented by Meyer Stein, 515 West End avenue, New York City, with capital of 100 shares of stock, no par value, plans operation of local plant for manufacture of paper boxes of various kinds, cartons and other containers.

New Hope, Pa.—During a recent storm, one of the large brick stacks at plant of the Union Mills Paper Manufacturing Company, Inc., was struck by lighting. Damage cannot be repaired and it is proposed to tear down the stack in near future, and rebuild. The damage will not interfere with operations at the mill, which is operating with sizable working quota. Estimated loss of damage noted has not been announced.

Bogalusa, La.—The New Orleans Corrugated Box Company, New Orleans, La., is continuing on a capacity schedule at its Bogalusa plant, and reports a considerable increase in orders, insuring maintaining of present working basis for some weeks to come. A large working force is being employed.

Malden, Mass.—The Barrett Company, 40 Rector street, New York, manufacturer of roofing papers, tar products, etc., will hold in temporary abeyance construction of proposed new plant on tract of land acquired a number of weeks ago at foot of Commercial street, Malden, fronting on Malden River. It is understood that project will be placed under way early next year. New plant is reported to cost over $150,000, with equipment.

Roanoke, Va.—The Viscose Company of America, Inc., is advancing production schedule at cellulose rayon mill at Roanoke, and adding to working force. This is the third step-up in operations since the plant resumed operations in July.

Albany, Ind.—The Albany Paper Corporation, recently organized by A. E. Bentham, Albany, and associates, is said to be planning operation of local plant for manufacture of a line of paper specialties. Walter E. Butler, Albany, is interested in new company.

Orange, Tex.—The Commercial Pulp and Paper Company is arranging for early increase in production schedule, and will add about 200 men to present working force. Company is said to have secured some large orders.

Elkton, Md.—The Elkton Pulp Works, operated by the Jessup & Moore Paper Company, Wilmington, Del., were slightly damaged by fire, September 4, when adjoining lumber storage plant, owned by another company, was destroyed. The loss at the pulp works will not interfere with operations, it is said.

New Bedford, Mass.—The New Bedford Rayon Company, manufacturer of cellulose rayon products, has resumed operations at its mill, following shutdown of about a month. A large number of workers have been recalled.

Rochester, N. Y.—The Rochester Folding Box Company, Boxart street, has adopted a capacity schedule, with full working force in all departments. It is proposed to start up an overtime night shift at once.

Tokyo, Japan—The Oriental Rayon Mills, Ltd., Tokyo, manufacturer of cellulose rayon products, is planning early construction of a new mill in the vicinity of its present plant in the Shiga district. It will consist of several buildings, and is reported to cost over $400,000, with equipment.

What Is Happening to Business Administration and Business Organization*

How Will They Affect the Trade Association and the Trade Association Executives' Program and Methods?

By George F. Barber[1]

I have a very dear friend who occasionally indulges in a protracted spree. He always winds up these sprees at some sympathetic doctor's office with a most amazing list of pains and ailments. If half of these ailments were as serious as they sound, he could keep an entire hospital staff active holding life in his aching body. In lurid and accurate detail he will complain of a leaking heart, acute diabetes, rheumatism, jaundice, and other serious afflictions, and he fairly revels in huge doses of medicine and countless pills for weeks afterwards. Ordinarily it takes him an hour and a half to tell his acquaintances how very sick he is, but if you are a friend of his he can boil it down to twenty minutes.

He has just finished up quite a lengthy spree and seeing me the other day, he started to tell me of the sad condition of his heart and kidneys, his spinal column and his liver. Since by nature he happens to be as robust as a prize bull, and never could be one tenth as sick as he imagines himself to be, I guess my lack of sympathy was evidenced in my face for at the second sentence he suddenly heaved a tremendous sigh and said: "Oh well, it was a heck of a good jag anyway," and stalked off about his business. This friend of mine is a real person and I had forgotten him until I commenced writing this speech, when suddenly I realized the close resemblance between him and our mutual friend Uncle Sam.

Nationally we have been on "a heck of a good jag anyway," and since in the cold grey dawn of the morning after it does no good to try and remember whether it was the Dry Martinis or the ancient and honorable Bourbon which caused our downfall, let us say little or nothing of how we became nationally intoxicated, but turn all of our attention to recovering our sobriety and preventing ourselves from ever getting nationally drunk again because: one more spree like the last one we had may bankrupt us economically and turn our nation over to Bolshevism and Communism.

It has become quite apparent that no political doctor or financial surgeon can do more than temporarily alleviate our suffering—the cure lies in ourselves and only we business men can effect it. The experts in government and economics, the specialists in money and law, the erudite in inspiration and bally-hoo, have alike failed to cure us or even fully to arouse us as to what we must do to get over our hang-over. Because we business men must cure ourselves, and because I am a business man, I am glad of this opportunity to help in my limited way toward the restoring of business sobriety and business right living, and I thank the A.T.A.E. for this privilege.

What Will Happen During the Cure

What will happen to business administration and organization during the cure?

Let us face the cold hard facts as they are and tell the bitter truth in plain words.

Aren't we all still a little drunk? Of course it may be that needing a little of the hair of the dog that bit us to taper off, that the little shot of inflation we are taking has befuddled us just a trifle even though it has steadied us quite a lot. But in spite of that, aren't we all a trifle shaky, isn't our courage desperately low, and don't our insides tremble in a peculiar way as we face this new day? I don't know but my guess is that is precisely how most of us business men feel just now.

What We Are Confronted With

Now let me lay aside this simile of the average industrialist and a recovering toper, and try to state what we business men are NOW confronted with.

It seems to me that the inescapable facts are:

1. There are 10,000,000 workers out of employment.
2. We are not consuming nearly what we produce.
3. Banking and credit are utterly inadequate for business needs.
4. One billion dollars of currency has been withdrawn from circulation and is hoarded in safety vaults.
5. Taxation of business is becoming almost unendurable.
6. Small businesses are being annihilated in droves.
7. Half of our corporate wealth is owned by 200 corporations.
8. These 200 corporations are ostensibly owned by the public but they are controlled by non- or little ownership management.
9. Legal devices utterly prevent stock-holders from exercising any voice in the administration of half of our business wealth.
10. We cannot understand that we are part of this world of ours, but insist we are a world apart.

That list could have been easily swelled to 25 other symptoms of illness, but the ten I have named seemed to me to be the most important.

Reverting to my simile again for a moment: What a headache we've got! But like my friend's case it isn't nearly as serious as some of us think it is and we can cure ourselves more quickly than any doctor can. How are these things affecting business administration and organization at this time and how are they likely to affect them in the future?

A Few Careful Observations

Let us take a few careful observations and check them for accuracy as we go along.

Millions Out of Employment

1. There are 10,000,000 workers out of employment.

That is approximately triple our normal quota. In other words we have approximately 7,000,000 who are out of work—or one in every 7 workers cut off from the pay-roll.

What is happening? Those who have work are supporting those who have no work. And so we have Federal aid, State aid, Municipal aid, Private aid, and aid as long as we do not use the word DOLE to describe it: The word dole is taboo. We are hatching plans for staggered employment, for 6 hour days, for 5 day weeks, for voluntary vacations, for unemployment insurance, or anything else

* Address delivered before the American Trade Association Executives, Atlantic City, N. J., September 14, 1932.

[1] Sales Manager, Reading Paper Mills, Reading, Pa.

which will keep the unemployed from remembering that they have no work to do.

The eternal logic of all these movements is either to divide up all the work we have to do until all of us work an equal length of time, an hour a day, or a day a week, spending the rest of our time in leisure, or to turn back the wheels of time and resurrect the happy (?) 12 hours a day of pick as against 5 minutes with the steamshovel; spans of horses instead of tractors; hand work instead of pneumatic or machine tools. That is the logic of these movements.

10,000,000 workers out of employment has induced hysteria instead of thought, expediency instead of planned and regulated activity.

10,000,000 unemployed workers have reduced us to hysterics right now, but they may drive us mad before very long.

Not Consuming What We Produce

2. We are not consuming nearly what we produce. An Irish friend of mine put this problem into words more succinctly than any economist I have ever heard when he said, "You can't buy what you want to eat and use unless you don't pay for it," and that is precisely what altogether too many people are doing just now . . . not paying for it. The present policy of John American Public seems to be "Get along as best you can with what you've got, and pay as little and as seldom as possible for what must be purchased."

What is that policy doing to business administration and organization? Well, for one thing, it is making business men forget all the painful teachings they so laboriously learned about costs and cost-finding, making them ignore their credit lessons, making them fly into highways and byways with cheaper, adulterated goods, and hare-brained schemes which are gradually bankrupting them.

Banking and Credit Inadequate

3. Banking and credit are utterly inadequate for our business needs. Between the many hundreds of banks which have closed their doors, and the keep-liquid-policy of those which remain open, money for business purposes has almost disappeared. The net result of this has been almost to strangle ordinary business speculation in inventories, stop advertising and even selling efforts, and desperately try to force back and even further back the financial burden of supplying the world its needs. The three month trade acceptance is becoming almost legal tender for something has to take the place of money if we are to continue to do business. The situation is easing up quite a little however, thanks to the Glass-Steagall bill and other heroic measures, but it is still very acute.

4. One billion dollars in currency has been withdrawn from circulation and is hoarded. Since we have only 5 billions in circulation when times are good, this means that we have practically retired $1.00 out of every five and are getting along on 80 per cent of our cash. Since our banks are also grimly hanging on to a tremendous amount of cash . . . estimated at a billion dollars more than they formerly carried in cash, that means that we are trying to do a dollars' worth of business with only 60 cents, and that is a very difficult task indeed. In fact balancing an eel on your nose is quite simple compared to it.

Taxation Becoming Unendurable

5. Taxation of business is becoming almost unendurable. Let us say very little indeed about this state of affairs because wherever and whenever taxes get too high, physical violence nearly always follows and more regimes, kingdoms and civilizations have perished thru over taxation than from any other cause. Our own nation was born as a result of taxation which was unendurable . . . . and we are by no means in sight of the peak of rising taxation; taxes may double themselves before long.

Small Business Being Harmed

6. Small business owners are being annihilated in droves. This phase of our national headache is very serious for it threatens our whole economic system and if it cannot be stopped will ultimately drive us into a very undemocratic form of government. It is with us however and growing worse so the sooner we face the music and see what we can do to cure it, the better off we shall be.

I shall discuss 7, 8, and 9 together.

7. Half of our corporate wealth is owned by 200 corporations.

8. The 200 corporations are ostensibly owned by the public but they are controlled by non-ownership management.

9. Legal devices prevent stock-holders from exercising any real voice in the management.

25,000,000 people own these companies. Less than 2500 people probably about 500 people, actually control them. At their present rate of growth these companies will shortly own 75 per cent of all our corporate wealth. In the meantime 48 different states interpret corporation law differently and clever legal minds are always working to sustain the minority management against the mere stockholder. If these three symptoms do not spell serious trouble then no symptom that I have named means anything.

What We Cannot Understand

10. We cannot understand that we are part of this world of ours but insist we are a world apart. Now that we have succeeded in convincing all of our international neighbors that tariff walls and import quotas are excellent devices for keeping one's own industries humming with activity we are stunned to learn that they have adopted these devices instead of contenting themselves with admiring our tariff wall.

France, Germany, South America, and finally the great commonwealth of nations called the British Empire, have decided to tax our goods upon entry into their territory with the net result that we are losing hundreds of millions of trade every year. We have also decided that Russia is not part of this world of ours because we do not like the way she conducts her internal affairs. I am not here to argue these points. I merely state them as facts, as things to cure if we are to return to peace and prosperity, to sobriety and happiness.

Now what can we business men and what can you as heads of our business organizations do about these things? According to the gentleman who so generously titled my address for me, I am supposed to tell you what is happening to Business Administration and Organization, and having done that, to tell you how these things affect the Trade Association and you as Trade Association Executives. Now that you have had a rather comprehensive view of what is happening to business and business men throughout the United States, don't grow unduly alarmed and feel that all is lost and that as Mr. Mantalini would say, "We are going to the demnition Bow-wows." On the contrary the very symptoms which are causing us so much distress just now constitute the greatest blessing that has fallen upon us in fifty years at least.

The Part of the Trade Association

Until and unless a man is very ill indeed he rarely takes the task of restoring his health very seriously, and we are now sick enough to go about curing ourselves and prevent-

ing further illness. In that cure you who are the chosen leaders of our only form of business organization, are going to take a leading part, and are going to save us. We business men have only one form of organization capable of dealing with the conditions I have described and that is our trade associations. True, the trade association as originally conceived around 1850 and as operated since that time was neither organized nor asked to function along the lines it must now operate on. Originally the trade associations were conceived to take advantage of favorable business conditions and they finally became defensive organizations safeguarding trade against demoralizing and ruinous practices and fostering co-operative trade action.

Amongst the many splendid defensive tactics they have adopted are:

Unified cost accounting.
Joint industrial advertising plans and appropriations.
Joint industrial research.
Improvement of marketing methods.
Credit bureaus.
Information clearing houses.
Development of technique for dealing with labor, etc. etc. etc.

Not a single inch of ground gained through those splendid efforts must be lost or abandoned, but the operations of Trade associations and the power of their executives must be indefinitely widened.

Resell the Trade Association

One of the first steps to be taken is to re-sell every trade association member and every industrialist not now an association member on association purpose and plans. This CAN be done—there never was a time when business men were so eager to co-operate toward the saving of our industries.

We know that the United States Department of Commerce has urged us to co-operate in industry, we know that High Judicial opinion no longer reads the Sherman and Clayton acts as narrowly as formerly, we are encouraged by the words of the President to work solidly together in our business enterprises, and now we are looking for a program which will deal with modern conditions in a modern and effective way. We business men know that there cannot possibly be a single program dealing with the problems of all industry, but that each industry must have its own program, for industry as a whole is too large and complicated to be encompassed in a single plan—we must divide and conquer.

We want a program within each individual industry based upon a current unbiased survey of the actual needs of each industry. It is not to be expected that I can formulate such a program here, for there are several hundreds of industries represented in this chamber, but I will try to give a high light or two of such a program as is now necessary in Trade Association work.

What the Association Should Do

We business men want to co-operate and are willing financially to back an effective trade association which will deal for us with:

1. The labor conditions in our industry.
2. Our industrial banking situation.
3. Taxation on our merchandise and operations.
4. The credit situation in our industry.
5. Effective discipline for selling below cost of production.
6. Regulation of new entries into our field of industry.
7. Regulation of output of our industry to consumption capacity.
8. Foreign outlook of our industry.

If that be treason, Gentlemen—make the most of it, for that is what we want and that is what we purpose to get for the good of our millions of employees, for the good of the country, and for our own ease and peace of mind.

1. Our trade associations ought to be able to cope with such problems as hours of labor, as rates of wages, as number of people to be employed, and as to unemployment doles or compensations or insurance—call it what you will.
2. We business men through our associations ought to be able to work with our bankers so that essential needs and periodic accommodations can be had for our industry when wanted.
3. I see no harm whatever in joining with other association tax bureaus in vigorously fighting vicious taxation; it is better that we do this than that some badly led mob finally burn down our cities.
4. Certainly we can control credit—we don't, except in a desultory way.
5. Where men deliberately sell under known and proven costs, they should be, they must be punished promptly and drastically for the good of all business.
6. Every good profession, engineering, law, medicine, teaching, qualifies its entrants through careful examination and if an applicant cannot pass he cannot practice the profession. The greatest profession of all, the profession of being a business man, admits anyone without qualification at any time—that is a bad public policy. It would be better to allow anyone to practice medicine without any training or examination than it is to allow anyone not qualified to practice business. This can and should be regulated in defense of the entire public.
7. Managed production is here. It was inevitable under the scheme of things and I know of no way to regulate output except through some co-operative association such as you head up, or through Governmental edicts—God save us from the latter!
8. We have been fooled and humbugged so much by our political leaders or by special pleaders on this subject of tariffs and foreign affairs that we as a body of American men simply have to take up this matter for ourselves whether we like it or not, and our Associations can do this job more effectively than any office holder in the land.

Those are some of the things we want but each industry is a special study in itself as to its needs and consequent program. Please dismiss from your minds any thought that I am radical in my demands for compared with many of my business friends I am very conservative. All that I have done is to reduce to coherent language the sullen muttered comments of my fellow industrialists; all that I have done is to try to visualize the future of our Trade Association activities. The things which I have merely touched upon are part of our crying needs and will be secured in one form or another.

Gentlemen, we business men built this modern world of ours. We are the creators of civilization as it now exists, we lifted living standards to where they are, we made all this comfort, this luxury, this magnificence. We built it just as we developed steam engines, and when we had our steam engines, we had to develop a governor to keep them from racing themselves to death and a safety valve to keep them from blowing us up—we created this era of good living just as we created automobiles and invented four wheel brakes to make them safe to use, just as we discovered electricity and harnessed it into serving us with absolute safety. We built this so-called Mechanical Age, bringing in its train more luxury and comfort than Emperors formerly enjoyed. We business men gave every

(Continued on page 44)

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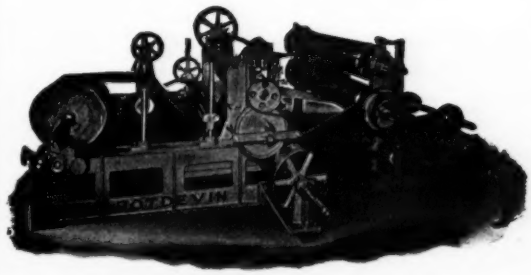

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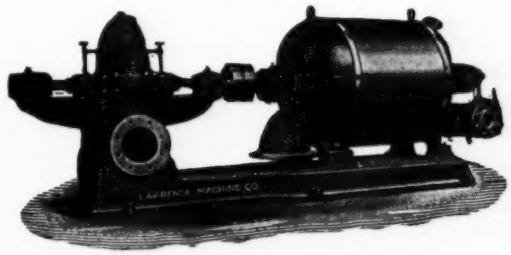

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WALL PAPER

Globe Shipping Co., Pr. Roosevelt, Hamburg, 1 cs.; Irving Trust Co., Hamburg, Hamburg, 5 cs.; Globe Shipping Co., Hamburg, Hamburg, 2 bls.; Heemsoth Basse & Co., Hamburg, Hamburg, 1 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., Samaria, London, 1 cs.; Atlantic F'd'g Co., Champlain, Havre, 1 cs.

HANGING PAPER

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NEWS PRINT

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STENCIL PAPER

Bush Service Corp., Mauretania, Southampton, 2 cs.

CARD BOARD

Gavaert Co. of America, Pennland, Antwerp, 3 cs.; G. M. Thurnauer, Pennland, Antwerp, 3 cs.; Coty Processing Co., Champlain, Havre, 7 cs.; American Express Co., Mauretania, Southampton, 2 cs.

CARD BOARD BOXES

Cheramy, Inc., Mauretania, Southampton, 13 cs.; Clay Adams Co., Inc., Hamburg, Hamburg, 4 cs.

MISCELLANEOUS PAPER

D. F. Young, Dresden, Bremen, 15 cs.; E. H. Dick, Dresden, Bremen, 11 bls.; Steiner Paper Corp., Statendam, Rotterdam, 19 cs.; Keller Dorian Paper Co., Champlain, Havre, 1 cs.; N. McClelland, Champlain, Havre, 1 cs.; Wedeman Godknecht & Lally, Hamburg, Hamburg, 2 cs.; ——, Hamburg, Hamburg, 2605 rolls.

RAGS, BAGGINGS, ETC.

——, Tuscania, Glasgow, 40 bls. paper stock; E. J. Keller Co., Inc., Statendam, ——, 19 bls. rags; E. J. Keller

SERVICE
and
QUALITY

at fair prices is our Motto.

H. & M. COLORS

are meeting with universal success in all sections of the country.

HELMERCO BLUE

Consult us regarding various shades for tinting fine papers.

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ALUMINUM SULPHATE
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THE Standard Purity of this Company's product is maintained in an uncompromising degree, regardless of whether successive deliveries are from one or various of the Company's Works.

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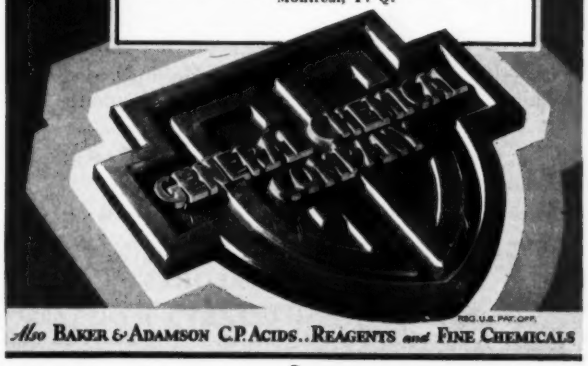
In Canada: The Nichols Chemical Company, Ltd. Montreal, P. Q.



Also BAKER & ADAMSON C.P. ACIDS..REAGENTS *and* FINE CHEMICALS

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

High Grade Coated Book

also

KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

230 Park Ave. New York | 35 East Wacker Drive Chicago

503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

Co., Inc., Collamer, ——, 87 bls. rags.; Amtorg Trading Corp., Scanpenn, Leningrad, 95 bls. rags; Banco Coml Italiane Trust Co., Pr. Roosevelt, Hamburg, 43 bls. paper stock; E. J. Keller Co., Inc., Pr. Roosevelt, ——, 54 bls. rags, 20 bls. twine waste; E. J. Keller Co., Inc., Hamburg, ——, 35 bls. rags, 14 bls. rope waste; Chase National Bank, Hamburg, Hamburg, 52 bls. rags; E. J. Keller Co., Inc., United States, ——, 116 bls. rags; E. J. Keller, Albert Ballin, ——, 12 bls. rags, 14 bls. rope waste; E. J. Keller Co., Inc., Manhattan, ——, 42 bls. rope waste; E. J. Keller Co., Inc., Pipestone County, ——, 70 bls. rags; ——, Samaria, London, 146 bls. paper stock.

OLD ROPE

——, Samaria, London, 35 coils.

BONE GLUE

——, Hamburg, Hamburg, 260 bags.

CHINA CLAY

Whitaker Clark & Daniels, Bristol City, Bristol, 390 bags; ——, Bristol City, Bristol, 25 casks.

WOOD PULP

Lagerloef Trading Co., Scanpenn, Helsingfors, 270 bls. sulphite, 54 tons; Castle & Overton, Inc., Hamburg, Hamburg, 275 bls. wood pulp, 55 tons.

WOOD PULP WADDING

Bendix Paper Co., Statendam, Rotterdam, 25 cs.

WOOD FLOUR

State Chemical Co., Statendam, Rotterdam, 700 bags.

BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 10, 1932

E. J. Keller Co., Inc., Collamer, ——, 352 bls. rags; United Clay Mines Corp., Bristol City, Bristol, 340 bags china clay; J. W. Hampton Jr. & Co., Bristol City, Bristol, 60 bags china clay; Castle & Overton, Inc., Scanpenn, Wiborg, 1273 bls. wood pulp, 254 tons; Lagerloef Trading Co., Scanpenn, Wiborg, 2002 bls sulphite, 356 tons; J. W. Hampton Jr. & Co., Scanpenn, Kotka, 81 rolls news print; Paper Manufacturers Co., Scanpenn, Kotka, 81 rolls news print; Paper House of Penna., Scanpenn, Kotka, 37 bls. news print; Lagerloef Trading Co., Scanpenn, Kotka, 260 bls. mechanical pulp, 52 tons; 615 bls. sulphite, 112 tons; ——, Scanpenn, Kotka, 340 bls. sulphite, 68 tons; Perkins Goodwin & Co., Scanpenn, Gdynia, 1000 bls. wood pulp, 209 tons; Johaneson Wales & Sparre, Inc., Scanpenn, Gdynia, 336 bls. wood pulp, 50 tons; Guaranty Trust Co., Scanpenn, Gdynia, 336 bls. wood pulp, 50 tons; Guaranty Trust Co., Scanpenn, Gdynia, 1198 bls. wood pulp, 185 tons; E. J. Keller Co., Inc., Exochorda, ——, 42 bls. rags; E. J. Keller Co., Inc., Lehigh, ——, 142 bls. flax waste.

ALBANY IMPORTS

WEEK ENDING SEPTEMBER 10, 1932

A. P. W. Pulp & Power Co., Winroth, Sheet Harbor, 12,825 bls. pulpwood, 2864 tons.

NORFOLK IMPORTS

WEEK ENDING SEPTEMBER 10, 1932

De Manduit Paper Corp., Callamer, St. Nazaire, 100 cs. cigarette paper.

BOSTON IMPORTS

WEEK ENDING SEPTEMBER 10, 1932

International Paper Co., Humberarm, Dalhousie, 76 rolls news print; E. J. Keller Co., Inc., Hanover, ——, 436 bls. wood pulp.

Boston Paper Trade Happenings

BOSTON, Mass., September 12, 1932.—The Brown Company, manufacturers at Portland, Me., with offices at various centers, including Boston, the excellence of whose products is widely known, has announced Nibroc Wipers. These papers contain no lint and no grit. They are wonderfully absorbent and tough when wet. They can be washed like cloth, so that solid dirt will shake out. The cost is attractive—approximately forty square feet for 4½ to 5 cents. Nibroc Wipers are packed flat in sheets in two sizes. The announcement contains a list of consumer delivered prices in the six zones comprising the whole country and also lists the distributors of this product in the United States.

The first sales meeting for the season of the Storrs & Bement Company was held at the office of the firm Friday evening. Company business was discussed. President William N. Stetson, Jr., and General Manager John H. Brewer presided.

John L. Hobson, treasurer of the St. Croix Paper Company, Woodland, Me., with headquarters at the Boston office, left Saturday on a motor trip to Canada for a vacation.

J. N. McDowell, sales manager for the Carew Manufacturing Company, South Hadley Falls, Mass., and Roger Taft, of the Hammermill Paper Company, Erie, Penn., called on the trade last week.

Hubert L. Carter, president of Carter Rice & Co., Corp., has returned from a trip which included a meeting of the executives and representatives of the Hammermill Paper Company at Erie.

George H. Sweetnam, Cambridge, Mass., dealer in confectioners' papers and allied supplies, recently went on a trip to Stinson Lake, N. H.

A general reduction has been made on De Jonge coated papers, which are handled locally by Arnold-Roberts Company and Carter, Rice & Co., Corp.

WHAT IS HAPPENING TO BUSINESS?

(Continued from page 40)

living American fifty mechanical slaves to serve his needs.

Must Not Let These Things Destroy Us

Do you think in your most gloomy moments that we who created, builded, harnessed these things are not going to be able to regulate them, are going to watch them destroy us? No indeed!

We who are business men, are going to perfect regulators, governors, gyroscopes, four wheel brakes, or whatever safety valves and devices our particular industry may need. The reason that I was so pleased to come here today is that it is inevitable that we shall turn to our trade associations first, and thus the opportunity was given me to send a clarion call to every business man through you.

When you go back, tell him plainly, simply, even as I have told you—this is his own show,—CIVILIZATION—it is good, better than any so far. Please preserve it. Don't let it be destroyed. If I can help you and my fellow business men any more, please command me.

Pulpwood for Algonquin Paper Co.

OGDENSBURG, N. Y., September 14, 1932—A vessel carrying a large consignment of pulpwood for the Algonquin Paper Co. arrived here during the week and a large force of stevedores are being used in the unloading process. The cargo was brought from Canada where a huge timber preserve is maintained by the company. Another shipment is expected in the near future.

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

The B Q Inc.

QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company

Incorporated

200 FIFTH AVENUE NEW YORK, N. Y.

1864 1932

"EXCELSIOR" FELTS

for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY

CAMDEN, MAINE

SOLD BY

BULKLEY, DUNTON & COMPANY

75-77 Duane St., N. Y., and direct

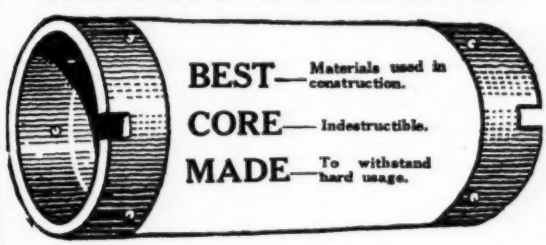
SHIPPING INSURANCE

The Use of

ELIXMAN CORES

protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

SHIPPING INSURANCE



Your two sources of supply are

Canadian Elixman Company
HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, September 14, 1932.

Conditions in the local paper market are gradually improving. Demand for the various standard grades of paper is more persistent than for some time past. Sales forces of the leading paper organizations are becoming more optimistic over the future outlook. Prices are generally holding to previously quoted levels.

The news print paper market is moderately active. Production in the United States and Canada is being maintained in sufficient volume to take care of current requirements. In some quarters sentiment is improving and increased consumption is anticipated during the closing months of the year. The price situation remains unchanged.

Demand for the various grades of paper board is more buoyant and operations are being speeded up accordingly. Prices are somewhat firmer. The fine paper market is displaying a stronger undertone. Demand for kraft wrapping paper is fairly active and quotations are considerably steadier now that there has been quite a sizeable reduction in excess tonnage.

Mechanical Pulp

Since last week no further changes have been reported in the ground wood market. Demand for both imported and domestic mechanical pulp is mainly along seasonal lines. Shipments against contract are going forward in moderate volume. There are several inquiries around for future account. Prices are steadier, in most instances.

Chemical Pulp

The chemical pulp market is attracting more interest than of late and there is a better sentiment around. Inquiries for future needs are fairly numerous, some of which should materialize into good orders. Prices of the various grades of domestic and imported chemical pulp are generally steadier.

Old Rope and Bagging

Quietness reigns in the old rope market at present. Paper mill demand for domestic and imported old manila rope is restricted. Small mixed rope is dull. Old rope quotations are steady, however. The bagging market is firmer. Demand for scrap and gunny bagging is active, while roofing bagging is also holding up well.

Rags

Paper mill interest in the domestic rag market is more in evidence than for some time past. Inquiries for the cotton grades are numerous. Roofing rags are steady, with offerings rather limited. Prices are firmer. The imported rag market, also, is sharing in the improved sentiment, although quotations continue nominal.

Waste Paper

The special feature of the week has been the general advance in paper stock prices. Hard white shavings, soft white shavings, book stock, old kraft machine compressed bales, and strictly folded news, shared in the improvement. Increased demand from the paper and board mills found a scarcity of offerings, resulting in the present firmer situation.

Twine

Some improvement was noticed in the twine market and although most of the business transacted at present is along routine lines a brisker demand is anticipated in the near future to keep pace with increased paper consumption. Prices of the various grades are to a great extent holding to previously quoted levels even though there has been keen competition.

Indianapolis Demand Reviving

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 12, 1932.—With the coming of the fall season and weather conditions favorable, the paper market in all lines here is slowly reviving. There is a more than usual volume of inquiries being received here from a widely scattered territory that should result in orders within the next week or two. At that, sales volume is improving and there is a much better tone to the market.

Local jobbers say there is quite a bit of social paper being sold for the fall season. The opening of schools has created the usual increase in paper of various grades, though jobbers say the volume is not more than was expected. The coming of fall sees a little increase in sales of building paper, but the volume for this fall is not expected to be large, though it should be better than last fall. The jobbers of building papers are not expecting much benefit from the passage of the home loan bank act in spite of glowing promises that it would give building an impetus almost immediately. The early predictions now are that the building loan companies will benefit mostly and that the act insofar as actual new construction is concerned will be of little aid.

A good demand continues for summer specialties in spite of cooler weather. The container plants have had a very good summer and the indications now are for a steady winter production. Demand for waxed papers, particularly for the baking industry, is heavy. One plant here is working virutally day and night and has been for months.

The opening of school caused an increase in demand for news print and the state papers are larger than they have been since mid-winter holiday period. All prices seem fairly staple and the jobbers are expecting no particular changes just now.

Paper stock men continue to sing the blues. Mill demand is not heavy and prices are very low. Warehouses are filled to capacity waiting for some kind of a break in favor of the collectors.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
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Mill Cogs

ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

READY TO RUN

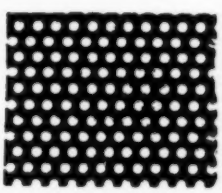
the moment driven and keyed. Write at once for circular "G" and instruction sheets free.

THE N. P. BOWSHER CO.
South Bend, Ind.
Established 1882

Perforated Metal Screens

For Pulp and Paper Mills

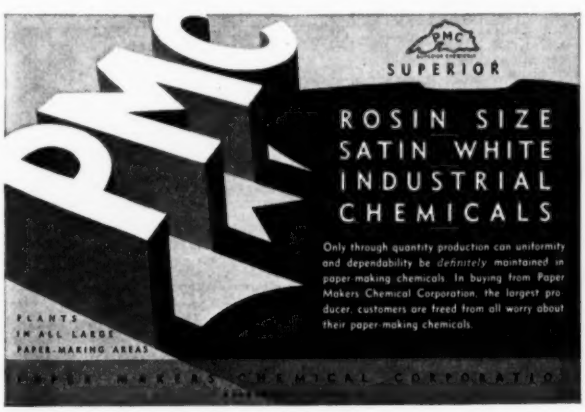
STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS

63-65 FAIRMONT AVE. JERSEY CITY, N. J.


PMC
SUPERIOR
ROSIN SIZE
SATIN WHITE
INDUSTRIAL
CHEMICALS
Only through quantity production can uniformity and dependability be definitely maintained in paper making chemicals. In buying from Paper Makers Chemical Corporation, the largest producer, customers are freed from all worry about their paper-making chemicals.
PLANTS IN ALL LARGE PAPER-MAKING AREAS
PAPER MAKERS CHEMICAL CORPORATION

BLEACH TANK WHITE

Formerly known as DAIRY WHITE.

Use BLEACH TANK WHITE as an inner coating for metal elbows and pipe connections in wood pipe lines. Make unnecessary the replacement of these metal parts with acid resisting steels, also coat the wooden pipe line to stop decay.

Ideal for coating the metal parts of agitators and parts in bleaching tanks, and concrete sulphite tanks.

SLEIGHT BITUMINOUS PRODUCTS COMPANY

BALTIMORE, MARYLAND

Liquid Rubber Latex for Paper Manufacturing

Latex can be used to advantage in a variety of paper processes.

Water proofing and other improved properties may be imparted to both coating and impregnating solutions.

It can be used in conjunction with most sizing materials,—

It involves no fire risk,—

Latex solutions can be used on several standard type paper making machines and do not require the purchase of new equipment.

CHARLES E. WOOD

INCORPORATED

Direct Importers of Crude Rubber, 60% and 38% Liquid Latex

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Telephone: Whitehall 4-2851-5 Cable Address: "Chasewood"

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Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E.I.C.
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Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants
Dams and other Hydraulic Structures.

GIANT

RAGS — BURLAP
BAGGING — ROPE

JUTE BUTTS, MAGAZINES, CATALOGS
OLD PAPERS, THREAD WASTE AND
ALL GRADES OF RAGS
CUT QUICKLY AND EFFICIENTLY
WITH THE

TAYLOR, STILES & COMPANY
GIANT
REG. U.S. PAT. OFF.
RIEGELSVILLE, N.J. U.S.A.

This is the GIANT 2A CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR
GIANT RAG CUTTERS HAVE CAPACITIES OF FROM 1 to 5 tons per hour.

THE STANDARD OF THE WORLD FOR 60 YEARS

TAYLOR, STILES & COMPANY

RIEGELSVILLE, N. J.

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Waterous Engine Works Company, Ltd., Brantford, Ont., Canada
SOLE AGENTS FOR EUROPE
J. J. Marx, 133-139 Finsbury Pavement, London, E. C.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, September 14, 1932.

BLANC FIXE.—Conditions in the blanc fixe market are fairly satisfactory. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ cents to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is only moderately active. Contract shipments are moving in fair volume for the season. Prices generally remain unchanged. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firmer. Domestic standard ground is now quoted at 5½ cents and finely ground at 6¾ cents per pound. Argentine standard ground is selling at 8 cents and finely ground at 8½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is fairly active. The contract movement is regular. Solid caustic soda is still quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is practically unchanged. Shipments against contract are fairly heavy. Imported china clay is quoted at from $10 to $15 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—While demand for chlorine is fairly persistent, intense competition has weakened the market and prices are decidedly easy. Chlorine is now quoted at $1.65 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is buoyant. The grades of gum rosin used in the paper mills are now quoted at from $4.15 to $4.35 per 280 pounds, in barrels, at works; while wood rosin is now selling at $3.00 per 200 pounds, in barrels, at southern shipping points.

SALT CAKE.—Steadiness prevails in the salt cake market. Prices remain unchanged. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works; while imported salt cake is selling at from $14 to $15 per ton, ship side.

SODA ASH.—The soda ash market continues to display steadiness. Shipments against contract are moving at a seasonal pace. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.25; and in barrels, $1.38.

STARCH.—Trading in the starch market is fairly active. The contract movement is well up to average. Prices are steady and unchanged. Special paper making starch is quoted at $2.44 per 100 pounds, in bags; and at $2.71 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Paper mill demand for sulphate of alumina is satisfactory for the time of year. Prices remain unaltered. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on order of 1,000 tons, or over, on yearly contracts, and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	38.00
Bonds	4.50	@	53.25
Index	6.00	@	12.00
Writings—			
Extra Superfine	6.50	@	15.00
Superfine	6.25	@	14.75
Tub sized	4.50	@	7.00
Engine sized	4.00	@	5.00
Book, Cased—			
S. & S. C.	5.25	@	—
M. F.	3.75	@	5.00
Coated and Enamel	6.25	@	9.75
Lithograph	6.75	@	11.25
Tissues—Per Ream—			
White No. 1	.50	@	.70
Anti-Tarnish M. G. only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.60
Kraft	.65	@	.70
Manila	.55	@	.60
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middies	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¾	@	—
No. 2	.11¼	@	—
Bleached, basis 20 lbs.	.11¾	@	—

(Delivered New York)

News, per ton—			
Roll, contract	53.00	@	—
Rolls, spot	53.00	@	—
Sheets	58.00	@	—
Side Runs	38.00	@	43.00
Kraft—			
No. 1 Domestic	4.75	@	6.00
No. 2 Domestic	2.50	@	—
Southern	2.50	@	—
Imported	2.75	@	3.50
Boards—per ton—			
News	22.50	@	25.00
Straw	29.50	@	35.00
Chip	22.50	@	25.00
Binders' Boards	62.00	@	70.00
Standard 85 Test Liner	24.00	@	26.50
Sgl. Mla. Lt. Chip	35.00	@	37.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—			
Moist	18.00	@	21.00
Dry	19.00	@	21.00

(F. o. b. Mill)

No. 1 Domestic	16.00	@	24.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.10	@	2.90
Easy Bleaching	1.60	@	1.75
No. 1 strong unbleached	1.40	@	1.60
Mitscherlich unbleached	1.60	@	1.75
No. 2 strong unbleached	1.25	@	1.35
No. 1 Kraft	1.50	@	1.65
No. 2 Kraft	1.30	@	1.40
Sulphate—			
Bleached	1.85	@	2.15

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.10	@	3.75
Easy Bleaching	1.75	@	1.90
News	1.50	@	1.65
Mitscherlich	2.40	@	2.55
Kraft (Domestic)	1.50	@	2.75

(Delivered Paper Mills)

Soda Bleached	2.25	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White ,No. 1.	4.00	@	4.25
New White, No. 2.	3.00	@	3.25
Silesias No. 1	3.75	@	4.00
New Unbleached	5.50	@	6.00
New Soft Blacks	2.75	@	3.00
Blue Overall	3.00	@	3.50
Fancy	1.50	@	1.75
Washables	1.15	@	1.40
Mixed Khaki Cuttings	2.50	@	3.00
Pink Corset Cuttings	2.75	@	3.25
O. D. Khaki Cuttings	3.00	@	3.25
Men's Corduroy	1.00	@	1.25
New Mixed Blacks	2.25	@	2.50

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White, No. 2—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.00	@	1.25
Black Stockings	2.00	@	2.25
Roofing Rags—			
No. 1	.53	@	.58
No. 2	.48	@	.53
No. 3	.43	@	.48
No. 4	.38	@	.43
No. 5A	.33	@	.38

Foreign Rags

New Rags

New Dark Cuttings	1.40	@	1.50
New Mixed Cuttings	1.60	@	1.75
New Light Silesias	3.40	@	3.50
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.50	@	6.00
New White Cuttings	4.25	@	4.50
New Light Oxfords	3.75	@	4.00
New Light Prints	2.00	@	2.25

Old Rags

No. 1 White Linens	5.25	@	5.50
No. 2 White Linens	4.50	@	4.75
No. 3 White Linens	3.25	@	3.75
No. 4 White Linens	1.75	@	2.25
No. 1 White Cotton	4.00	@	4.25
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.25	@	2.50
No. 4 White Cotton	1.40	@	1.50
Extra Light Prints	1.90	@	2.10
Ord. Light Prints	1.60	@	1.75
Med. Light Prints	1.40	@	1.55
Dutch Blue Cottons	1.35	@	1.40
French Blue Linens	1.80	@	1.90
German Blue Linens	1.70	@	1.80
German Blue Cottons	1.20	@	1.25
Checks and Blues	1.25	@	1.30
Lindsay Garments	.75	@	.80
Dark Cottons	.70	@	.75
Old Shopperies	.55	@	.60
New Shopperies	.60	@	.65
French Bites	1.25	@	1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.00	@	1.10
Domestic	1.15	@	1.25
Wool Tares, light	.80	@	.85
Wool Tares, heavy	.80	@	.85
Bright Bagging	.75	@	.80
Small Mixed Rope	.80	@	.90
Manila Rope—			
Foreign	1.50	@	1.60
Domestic	1.50	@	1.75
New Burlap Cut	1.65	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	1.60	@	1.70
Ordinary Hard White No. 1	1.35	@	1.45
Hard White No. 2	1.25	@	1.30
Soft White No. 1	1.30	@	1.40
Flat Stock—			
Stitchless	.55	@	.65
Overissue Mag	.55	@	.65
Solid Flat Book	.50	@	.55
Crumpled No. 1	.35	@	.40
Solid Book Ledger	1.50	@	1.75
Ledger Stock	.45	@	.55
New B. B. Chips	.20	@	.25
Manilas—			
New Env. Cut	1.25	@	1.35
New Cuttings	1.00	@	1.05
Extra No. 1 old	.80	@	.90
Print	.35	@	.40
Bogus Wrapper	.30	@	.35
Container	.25	@	.30
Old Kraft Machine—			
Compressed bales	.75	@	.85
News—			
No. 1 White News	1.15	@	1.20
Strictly Overissue	.35	@	.40
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.20

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Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finisned Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Pl—			
No. 1	.15½	@	.16½
No. 2	.11¾	@	.12¾
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine Balls	.08¾	@	.10¾
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¾
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¾	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¾	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¾	@	.06¾
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.07	@	.07¾
White Tissue	.07¾	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	53.00	@	—
Sheets	58.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.50	@	1.55
No. 1 Hard White	1.40	@	1.45
No. 1 Soft White	1.00	@	1.10
Ledger & Writings	.45	@	.55
Solid Books	.25	@	.30
Blanks	1.00	@	1.05
Krafts	.70	@	.80
New Kraft Cuts	1.15	@	1.25
Manila Env. Cuts	1.25	@	1.30
Ex. No 1 Manila	.90	@	1.00
Print Manila	.30	@	.35
Overissue News	.30	@	.35
Old Newspapers—			
No. 1	.25	@	.30
Mixed Papers—			
No. 1	.15	@	.20
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¾	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.03¾
Southern Kraft No. 2	—	@	.02¼
Common Bogus	.03	@	.04

(Delivered Philadelphia)

News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	22.00	@	25.00
Chip Board	21.00	@	23.00
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	62.00	@	65.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01	@	.01½
Blue Overall	.03	@	.03½
Cottons—According to grades—			
Washable No. 2	.01	@	.02
New Blue	.01	@	.02
Fancy	.01½	@	—
New Black Soft	.02	@	.03
New Light Seconds	.01	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.03½
No. 2 Mixed	.02½	@	.03
Corduroy	.02	@	.02½
New Canvas	.03½	@	.04
New Black Mixed	.02½	@	.03

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.00
Miscellaneous	1.75	@	2.00
M. G.	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.80

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	—
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	1.80	@	1.90
No. 2 Hard White	1.60	@	1.70
No. 1 Soft White	1.50	@	1.65
No. 2 Soft White	1.30	@	1.45
No. 1 Mixed	.40	@	.50
No. 2 Mixed	.35	@	.40
Solid Ledger Stock	1.00	@	1.10
Writing Paper	.80	@	.90
No. 1 Books, heavy	.55	@	—
No. 2 Books, light	.40	@	—
No. 1 New Manila	1.00	@	1.15
No. 1 Old Manila	.90	@	1.00
Print Manila	.40	@	—
Container Manila	.40	@	.45
Old Kraft	.85	@	.95
Common Paper	.15	@	.20
No. 1 Mixed Paper	.20	@	.25
Straw Board, Chip	.25	@	.35
Binders Board, Chip	.25	@	.35
Corrugated Board	.30	@	.35
Overissue News	.35	@	.40
Old Newspaper	.20	@	.25

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	—	@	.02½

(F. o. b. Boston)

Southern Kraft	—	@	.02½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¾

(Delivered New England points)

News Print, rolls	—	@	52.50
Straw Board, rolls	.009	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	25.00	@	30.00
Chip Board	—	@	25.00
Chip Board (Creasing)	25.00	@	27.50
Single Manila Lined Chip	—	@	35.00
Single White, Patent Coated News Board—Binder	45.00	@	55.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Soft White	—	@	1.50
No. 1 Old Manila	.65	@	.75
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.20	@	1.40
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.60	@	.70
No. 1 Books, heavy	.50	@	.60
No. 1 Books, light	—	@	.30
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.55	@	.65
White Blank News	1.00	@	1.05
Kraft No. 1	.90	@	1.00
Manila	.80	@	.90
No. 1 Mixed Papers	.12½	@	.15
Print Manila	.30	@	.40
Overissue News	.35	@	.45
Old Newspapers	.22½	@	—
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.17½	@	.22½
Screening Wrappers	.25	@	.32½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	1.10	@	—
Domestic	.80	@	.90
Manila Rope—			
Foreign	1.40	@	1.50
Domestic	—	@	1.60
Transmission Rope	1.00	@	—
Mixing String	—	@	.30
Jute Rope	—	@	.75
Jute Carpet Threads	.25	@	.30
Bleachery Burlap	1.75	@	2.00
Scrap Burlap	.60	@	1.00
No. 1 Scrap Burlap	.80	@	.90
Scrap Sisal	.75	@	.85
Scrap Sisal for shredding	.90	@	1.00
Wool Tares, heavy	.65	@	.75
New Burlap Cutting	.75	@	.90
Australian Wool Pouches	—	@	1.50
Heavy Baling Bagging	.90	@	1.10
Paper Mill Bagging	.50	@	.60
Bagging No. 2	.20	@	.25
No. 1 Burlap	1.80	@	2.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.01½
New White No. 1	.03¾	@	.04
New White No. 2	.02¾	@	.03¼
Silesias No. 1	—	@	.03
New Black Silesias	.02½	@	.02¾
New Unbleached	.05	@	.05¼
Fancy	—	@	.02½
Washable	—	@	.01¾
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03½
O. D. Khaki	.03½	@	.03¾
Corduroy	.02¾	@	.03
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White No. 2—			
Repacked	.02¾	@	.02½
Miscellaneous	.02	@	.02¼
Twos and Blues	.90	@	1.00
Thirds and Blues—			
Repacked	.75	@	.85
Miscellaneous	.70	@	.75
Black Stockings	2.00	@	2.25
Roofing Stock—			
No. 1	.32½	@	.37½
No. 2	.30	@	.35
No. 3	.25	@	.30

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.40	@	.50
New No. 1 White Shirt Cuttings	3.75	@	4.00
Dutch Blues	1.25	@	1.50
New Checks & Blues	2.25	@	2.50
Old Fustians	—	@	.75
Old Linsey Garments	.55	@	.65

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¾	@	
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.40	@	—
White Wrap	3.00	@	—
"B" Manila	4.90	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.40	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	52.50	@	53.00
Sheets	57.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	48.00	@	58.00
Sulphate	55.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	1.80	@	—
Soft White	1.40	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.25	@	—
Printed Manilas	.55	@	—
Kraft	1.75	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¾

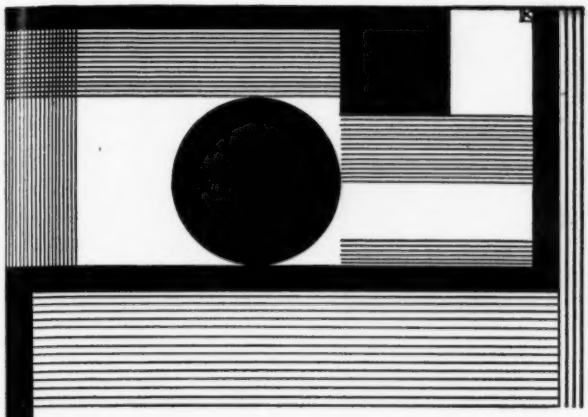

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TABLE OF CONTENTS

Copyright, 1932, by the Lockwood Trade Journal Co., Inc.

Technical Association Meets at Holyoke 11
Price Bros. Cut News Print Quotations 15
Scandinavian Competition 15
Westminister Paper Co.'s Earnings 15
Fraser Co.'s Reorganization 16
To Start Reforestation Tour 16
New Bleaching Process 16
Ground Wood Producers to Organize 16
Niagara Falls Mills Busy 16
Chicago Market Shows Improvement 17
Paperboard Convention Program 17
Salesmen to Entertain Merchants 17
J. Judd Dayton Dies 18
Bids for Government Paper 18
I. P. Co.'s Second Quarter Earnings 18
New York Trade Jottings 20
Remington Rand to Buy Paper 22
Boston Market Fairly Active 22
Demand Broadens in Indianapolis 22
Racquette Gets Foreign Order 22
Editorial 24
Files Brief for Paper Stock Shippers 25
Miami Valley Reports Improvement 25
Busy Unloading Russian Pulpwood 25
Japanese Paper Production 25
Technical Section
Pulp and Paper Industry Literature Review 27
Sulphite Pulping Process Developments 28
Practical Sulphite Cooking 29
New Amthor Hand Tachometer 35
Roll Coaters vs. Brush Coaters 36
Construction News 39
Export Agents for Howard Allied Mills 40
Small Pulpwood Peeling Output 40
Boston Paper Trade Happenings 42
E. J. McConnell Goes to Fitchburg 42
Imports of Paper and Paper Stock 43
New York Market Review 45
Miscellaneous Markets 46
Market Quotations 45

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 52-53

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